

EVERYMAN'S ENCYCLOPAEDIA

IN TWELVE VOLUMES
VOLUME TWO



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ABBREVIATIONS

The titles of subjects, which are printed first in bold type, have been abbreviated within each article to the initial letter or letters.

ac. , acre(s).	lat. , latitude.
agric. , agricultural.	lb. , pound(s).
ambas. , ambassador(s).	l. b. , left bank.
Amer. , American.	long. , longitude.
anct. , ancient.	m. , mile(s).
ann. , annual.	manuf. , manufacture(d).
arron. , arrondissement.	M.E. , Middle English.
A.-S. , Anglo-Saxon.	min. , minute(s).
A.V. , Authorised Version.	Mod. E. , Modern English.
b. , born.	m.p.h. , miles per hour.
Biog. Dic. , Biographical Dictionary.	mrkt tn. , market town.
bor. , borough.	MS., MSS. , manuscript(s).
bp. , birthplace.	mt. mts. , mount, mountain(s).
Brit. , British.	N. , north; northern.
c. , about.	N.T. , New Testament.
C. , Centigrade.	O.E. , Old English.
cap. , capital.	O.F. , Old French.
cent. , century (7th cent.).	O.T. , Old Testament.
chem. , chemistry.	oz. , ounce(s).
co. , county.	par. , parish.
com. , commune.	parl. , parliamentary.
cub. ft. , cubic feet.	pop. , population.
d. , died.	prin. , principal.
Dan. , Danish.	prof. , professor.
dept. , department.	prov. , province; provincial.
dimin. , diminutive.	pub. , published; publication.
dist. , district.	R. , riv., river.
div. , division.	R.A.F. , Royal Air Force.
E. , east; eastern.	r. b. , right bank.
eccles. , ecclesiastical.	rep. , republic.
ed. , edition; edited.	Rep. of Ireland , Eire.
educ. , educated.	R.N. , Royal Navy.
e.g. , for example.	Rom. , Roman.
Ency. Brit. , <i>Encyclopædia Britannica</i> .	r.p.m. , revolutions per minute.
Eng. , English.	R.V. , Revised Version.
estab. , established; establishment.	S. , south; southern.
fl. , flourished.	sec. , second(s).
Flem. , Flemish.	sev. , several.
fort. tn. , fortified town.	Sp. , Spanish.
Fr. , French.	sp. gr. , specific gravity.
ft. , foot.	sq. m. , square miles.
Ger. , German.	temp. , temperature.
Gk. , Greek.	ter. , territory.
gov. , government.	tn. , town.
Heb. , Hebrew.	trans. , translated; translation.
hist. , history.	trib. , tributary.
horticult. , horticultural.	U.K. , United Kingdom.
h.p. , horse-power.	U.N. , United Nations.
H.Q. , headquarters.	univ. , university.
hr(s) , hour(s).	U.N.O. , United Nations Organisation
in. , inch(es).	urb. , urban.
inhab. , inhabitant(s).	U.S.A. , United States of America.
is. , island(s).	vil. , village.
It. , Italian.	vol. , volume.
Jap. , Japanese.	W. , west; western.
jour. , journal.	Wm. , William.
Lat. , Latin.	yd(s) , yard(s).

Bar: 1. (until 16th cent. *Rov*). Tn in the Vinnitsa Oblast of the Ukraine, 45 m. W. of Vinnitsa. Pop. (1926) 9500 (c. 1914, 23,000). *See* BAR, CONFEDERATION OF THE.

2. Seaport in Montenegro, Yugoslavia, on the Adriatic. It has ant. fortifications, and is the seat of a Rom. Catholic archbishopric. It is developing into a port of importance. Pop. 4000.

Bar, in law, term used to denote collectively those members of the legal profession who have the right to plead on behalf of suitors. It is also applied to the enclosed space in a court of justice where such members of the profession may plead, and to the prisoner's dock. A peremptory exception sufficient to stop a plaintiff's action either temporarily or permanently is also termed a B.

Bar, in heraldry, *see* HERALDRY, *Ordinaries* (2).

Bar, in meteorology, *see* METEOROLOGY.

Bar, Confederation of the, confederation of Polish nobles, formed in 1768, at the fortress of Bar, in Podolia, for the purpose of defending Poland against the Russians. After many victories it estab. a gov., and, ignoring the pro-Russian Polish king, sent envoys to the courts of Europe. Its power subsequently declined and it was dissolved in 1776.

Bar, Trial at, in Eng. legal procedure, form of trial before a full bench of judges. It was the usual mode of trial prior to the writ of *nisi prius* (Statute of Westminster, 1285), and is now the only survival of the old procedure. Such a trial takes place in the queen's bench div. before a bench of judges and only in cases of great importance, or when demanded on behalf of the Crown by the attorney-general. The trial of Col. Arthur Lynch for high treason, 1904, and the hearing of the petition of right, 1905, to decide the responsibility of the Brit. Gov. for claims against the Transvaal Rep. for acts done by it before or during the S. African War, took place 'at Bar.' The last recorded T. at B. was that of Roger Casement for treason in 1916 (*see* CASEMENT, SIR ROGER DAVID).

Bar Association, American, was formed in 1878, after the Civil war, at a time when, as a consequence of that war, the course of judicial decision in the S. states had been affected in that the prominent positions both at the Bar and Bench had been taken by N. and W. lawyers, and the S. jurisprudence had come to lose such distinctive character as it formerly had. The unification of Amer. law was assisted by the A. B. A., and of the 15 signatories of the call for the preliminary conference 3 came from the S. states. Its ann. meetings are opened by a presidential address in which are communicated 'the most noteworthy changes in statute law on points of general interest.' Its committee reports have had con-

siderable influence in the shaping of the course of legislation, and it has improved legal education. Its membership, about 28,000, is representative of the whole Amer. Bar, and its ann. meetings are attended by as many as 2000 delegates. The H.Q. of the A. B. A. are at 1140 N. Dearborn St., Chicago, 10.

Bar Council, or, more fully, the General Council of the Bar, is the accredited representative body of the Eng. Bar: its functions are to act in a consultative and advisory capacity, dealing with all matters affecting the profession, such as the proposal and criticism of legal reforms, matters of practice, conduct, etiquette, etc. The body consists of the attorney-general and solicitor-general for the time being, the ex-attorney- and solicitor-generals, together with 48 selected members of the Bar, not less than 12 'inner' barristers (queen's counsel) and not less than 21 'outer' barristers (Juniors). The General Council was estab. in 1895, and replaced the Bar Committee, estab. 1883.

Bar Harbor, Hancock co., Maine, U.S.A., on the fashionable summer resort, Mt. Desert, an is. off the coast. It is a port of entry. Near by are a cancer laboratory and a marine biological laboratory. A forest fire destroyed most of the tn in 1947. Pop. 3864.

Baraba, wooded steppe area in SW. Siberia between the Irtysh and Ob, around the Lake Chany, traversed by the Trans-Siberian Railway. It has been colonised by Russians and Ukrainians since the 18th cent., and by Volga Germans since 1911. One of the main areas of Siberian dairy farming, it is now included in the Virgin Land campaign (q.v.).

Barabbas, or **Barabas** (Aramaic, 'son of the father'), the robber who was released instead of Christ by Pontius Pilate at the desire of the Jews. The MSS. contain certain evidence that his name was originally recorded as Jesus B., but the name Jesus was early expunged out of reverence for the name of Christ. If this is so, Pilate's challenge to the Jews in Matt. xxvii. 17 gains greatly in pungency, 'Whom will ye that I release unto you? Jesus B., or Jesus which is called Christ?' and especially so when the meaning of B.'s name is remembered. Together with the claim of Christ to be the Son of the Father.

Barabara, *see* BERABERA.

Baracoa, seaport in Oriente prov. in E. Cuba. The first white settlement in Cuba, and cap. of the is. from 1512 to 1514, it is now the centre of the banana and coco-nut export trade, manufacturing coco-nut oil, cigars, and chocolate. Pop. 10,400.

Baradla Caverns, *see* AGGTELEK.

Baraguay-d'Hilliers, Achille, Comte (1795-1878), Fr. marshal, son of Louis B.-d'H., b. Paris; was a soldier almost from childhood; had his left hand carried away by a cannon-ball at the battle of

Leipzig. He took part in the Sp. and Algerian campaigns, and was promoted to the rank of lieutenant-general. He commanded the Baltic expedition, took Bomarsund in 1854, and won the battle of Melejuana in 1859.

Barahona de Soto, Luis (c. 1535-95), Sp. poet, whom Cervantes praises highly in *Don Quixote*. He wrote a continuation of Ariosto's *Orlando Furioso*, the first part of which bears the title *Las lágrimas de Angélica*. He also wrote satires, eclogues, epistles, odes, and 2 classical fables.

Baraliopt, see SYLLOGISM.

'Baralong' Case, incident in the First World War. The Brit. armed auxiliary *Baralong*, disguised as a tramp steamer, sunk a Ger. U-boat which had torpedoed the *Nicosian*, an Amer. boat carrying cattlemen, Aug. 1915. The Ger. Gov. threatened ruthless Zeppelin warfare in retaliation, Dec. 1915.

Baranov, Baranof, or Sitka Island, is, in the Alexander Archipelago, Alaska, U.S.A. It is about 100 m. long, and its greatest breadth is 30 m. Coal and deposits of placer gold are found on it. The industries are fishing, fish processing, and lumbering. The cap. tn is Sitka (q.v.); pop. 2000.

Baranovich (Polish Baranowieze), tn in Brest Oblast of Belorussia, 90 m. S.W. of Minsk. Important railway junction (6 lines), and industrial centre. Pop. (1931) 30,000, before the war half Jewish. Cap. of B. Oblast 1939-54 (abolished).

Baranya County, see Pécs.

Baras Khotun, or Bars Khotan, City of the Tigers, formerly a large tn on the banks of the Kherlon, in the country of the Mongols; the ruins of the tn lie, according to Father Gerbillon, the only European who ever visited them, in 48° N. lat. and 113° 42' E. long. After the Moguls had been defeated and expelled from China, Toghon Timur, the Mogul emperor, built this tn as the future seat of the empire; he d. there in 1370.

Baratang, see under ANDAMAN ISLANDS.

Barataria 'country,' low-lying area of Louisiana, U.S.A., between New Orleans and B. Bay (35 m. away and 15 m. E. to W., 12 m. N. to S.), a lagoon of the Gulf of Mexico. With many waterways, oil and gas wells, and 'platform vils.' it is the centre of the Louisiana shrimp industry; there is also musk-rat trapping. Here the pirates under Jean Lafitte made their H.Q. c. 1810-15.

Baratier, Jean Philippe (1721-40), Ger. boy genius, b. Schwabach, near Nuremberg, was the son of François B., pastor of the Fr. Protestant church there. Before he was 5 years old he could speak Latin, French, and German, and could read Greek. At the age of 6 he began a 3-year course of Heb. study, reading the books of the Cabballists, Talmudists, commentators, etc. At 9 he collected materials for a dictionary of rare Heb. and Chaldaic words, with philological notes. He took his M.A. at Halle at the age of 14 and was received into the Royal Academy at Berlin. He then studied law, after

which he turned to hist., philology, and antiquities, writing sev. historical works. He d., however, before he reached the age of 20.

Baratieri, Oreste (1841-1901), It. general, b. Condino, in the Tirol. He served under Garibaldi in Sicily, 1860; was appointed Governor of Eritrea, in Africa, 1891, where he adopted an aggressive policy, and, advancing into the interior, captured Kassala, 1894. In the following year he twice defeated Ras Mangasha, but was put to rout with great loss of life to his men by the army of Menelik near Adowa, 1896. He was tried before a court-martial and was censured, 1897; he left the army the same year, and pub. his defence, *Mémoire d'Africa*, 1892-96, 1898.

Barb, name of a breed of bloodstock, reared by the Moors of Barbary and Morocco, and introduced by them into Spain. They are not remarkable for beauty or symmetry, but their speed, patience, and endurance are unrivalled. Probably nearly every Eng. racehorse of note has a strain of the blood of this animal. There has always been much controversy over the origin of the B. Prof. Ridgeway's view is that the anct Libyan type of horse was the ancestor of the modern B. It seems certain that the Libyan horse of Livy's time is the ancestor of the Barbary horse found in its purest form in Morocco to-day. This animal is usually about 14 hands and resembles the Arab horse, except that it has a convex profile and a longer croup. In recent times Fr. and Eng. blood has been freely used in Algeria for crossing with the local B.s, and these have consequently lost their former type, except in Morocco. In Spain to-day the B. blood is predominant in Andalusia, Granada, and other S. regions. The usual colour of the Sp. B.s (which are also influenced by the anct Libyan B.) is bay, but there are greys and blacks. In N. Spain they are mostly grey and smaller than the Andalusian horses. There was formerly great controversy on the question of the true nature of the highly prized N. African blood in the Celtic pony, some believing it to be Arab, while others were of the opinion that it was the forbear of the B. and not the Arab horse that was crossed with the Celtic ponies of the Low Countries, and those of the cognate breed in SE. England. It is, however, evident that it was not until many cents. later that an indisputably pure-bred Arabian horse reached England (1616). Shakespeare often refers to them, e.g. Iago mentions a 'Barbary horse' (*Othello*, i. i.), and Osric in *Hamlet* says that 'the king hath wagered six Barbary horses.' It is recorded that Henry VIII received 2 pure-bred Sp. B.s of good quality from Ferdinand of Aragon, and some writers assume that such horses laid the foundations, on the female side, for the thoroughbred stock which was to follow. Much controversy, too, existed as to whether the famous Godolphin, which came to England in 1724, was an Arab or a B. By whatever means the horse was obtained,

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it came eventually into the hands of Lord Godolphin, and became one of the 3 founders of Eng. bloodstock (the other 2 being the Beyerly Turk and the Darley Arabian). The Godolphin was a dark bay, about 14-3 hands. Maj. Lamb thinks that the horse was a B. because he 'probably came from Morocco' and had 'a distinctly B. appearance.' The strain of this great horse exercised much greater influence in earlier days than it does to-day, for the Darley Arabian is undoubtedly the ancestor of many more famous latter-day horses than is the Godolphin. On the other hand, other writers, including Lady Wentworth, consider that the Godolphin was not a B. at all, but an Arabian, and that 'the only genuine and contemporary picture painted from life by Wootton shows him to be a high-class Arab.' See W. Ridgeway, *The Origin and Influence of the Thoroughbred Horse*, 1905; A. J. R. Lamb, *The Story of the Horse*, 1938; Lady Wentworth, *Thoroughbred Racing Stock and its Ancestry*, 1938.

Barbacena, silk manuf. city in the state of Minas Geraes, Brazil, on the W. slope of the Serra Mantiqueira, 120 m. NNW. of Rio de Janeiro. Industrial centre and flower-growing area for the Rio market. Elevation about 3700 ft. Pop. 25,770.

Barbacoas, tn in Nariño dept, Colombia, 140 m. N. by E. of Jinto, on the Telembi, a trib. of the Patia, and navigable from the sea. Once a rich gold-mining centre, it now trades in agriculture, live-stock, and forest products. Pop. 3740.

Barbados, most easterly of the W. Indian Is.; it is 21 m. in length and 14 m. broad, and its total area is 166 sq. m., or rather larger than the Isle of Wight. Bridgetown is the cap., situated in lat. 13° 5' N. and long. 59° 41' W. The pop. of the is. is about 227,550, or over 1350 to the sq. m., the densest in the W. Indies. The is. is of coral formation, and almost encircled by coral reefs which are dangerous to navigation. The surface is flat except in the Scotland dist. in the NE. of the is. Much of the soil has little depth, although it is very fertile. This fertility is a result of successive eruptions of the Soufrière in St Vincent (q.v.), the ashes of which, carried by an upper current of air for a great distance, fell as lately as 1902 over the is. The first recorded fall was in May 1812 and is still spoken of as 'May dust.' B. has no natural harbour, but the open roadstead of Carlisle Bay is well sheltered and there is a small inner harbour or carenage protected by the molehead. There are no rivs. worthy of mention, the porous soil forming subterranean channels and wells which percolate to the sea below low-water mark. There are only 46 ac. of indigenous forest.

History. B. is generally supposed to have been visited in 1536 by Portuguese navigators, who called it Los B., after the bearded fig-trees there. The first Englishman to visit B. may have been Capt. Simon Gordan who claimed to have landed some time before 1627 and found the is. uninhabited. A ship commanded by Sir Thomas Warner visited the is. some time

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between 1620 and 1624, but did not land settlers. Capt. John Powell, commanding a ship belonging to Sir Wm Courteen, touched at B. in 1624 or 1625, but the first settlers were landed from the *William and John*, another ship sent by Courteen, in Feb. 1627. In 1625 the is. was included in the commission given to Sir Thomas Warner (see ST KITTS), under the patronage of the Earl of Carlisle, who, later, had a grant from Charles I of most of the Caribbean Is. The Earl of Marlborough, who had given his patronage to the Courteen expedition, opposed the grant, and a compromise was reached; but subsequently the Earl of Pembroke succeeded in obtaining a grant of the is. Carlisle, however, returned to B. and, his rights having been restored, he lost no time in consolidating his position by offering land to speculators who founded St Michael's Town, now Bridgetown. Eventually Carlisle's heir assigned his interest to Francis Lord Willoughby of Parham, who, however, while securing his own position under an Act of Parliament, acknowledged the king's right to dominion over the is. During the Civil war many royalist families fled to B. Cromwell sent a fleet under Adm. Sir George Ayscue to subjugate the is., and in 1652 Willoughby had to surrender the reins of gov. But on the Restoration Charles II gave honours to many prominent Royalists in B., in recognition of their loyalty and defiance of Cromwell. Lord Willoughby agitated for the restoration of his rights, and in 1665 the Privy Council allocated the profits derived from the is. between him, the gov., and the heirs of Marlborough and Carlisle. This involved raising a duty of 4½ per cent on all the is.'s exports, which cost the inhab. an enormous sum in the ensuing years, and in 1834 the is.'s legislature passed an Act remitting the duty, which, however, was only finally repealed in 1838 by an Act of the Imperial Parliament.

Crops, resources, climate, administration, etc. The is. is very highly cultivated; sugar is the staple product, nearly 70,000 ac. being devoted to sugarcane cultivation, of which some 46,000 ac. are under cane each year. The average ann. production of sugar and fancy molasses is equivalent to 168,000 tons of sugar. Other products are rum, coco-nuts, and cotton. Like most W. Indian Is., B. suffered from the sugarcane crisis that followed the increased production of subsidised beet sugar. Petroleum is believed to exist and boring operations have been conducted in recent years, though without much success. B. is a popular tourist resort and the healthiest of all the W. Indian Is. for Europeans; the great heat is moderated by the NE. trade winds, particularly from Jan. to May. The temp. varies from 75° F. to 83° F., and in the winter months the minimum mean temp. at night is as low as 63° F. The ann. rainfall is from 50 to about 75 in. Hurricanes and earthquakes occur, but not frequently. The is. is much favoured by residents in neighbouring colonies as a health resort. The

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is. is divided into 11 Church of England parishes, and is the see of the Bishop of B. The chief justice of the is. presides over the Superior Courts, and grand sessions are held every 4 months. The legislature comprises the governor, the executive council, and the executive committee, a nominated legislative council and a house of assembly of 24 members elected by universal adult suffrage for 5 years. Education is free in gov. elementary and senior (i.e. secondary) schools. Fees are charged in aided and independent schools. Codrington College, affiliated to the Univ. of Durham, functions as a theological college. B. contributes also to the Univ. College of the W. Indies, which is situated in Jamaica. There are over 500 m. of main and secondary roads, and 10,000 m. of telephone line. B. is the trade mart for the Windward Is. which lie to the W. The chief exports are sugar, fancy molasses, and rum; the imports are cotton goods, chemical manures, rice, dried fish, and machinery. Bridgetown (q.v.) is the cap. and prin. tn; there is an airfield at Seawall (8 m. ESE.). Sam Lord's Castle, in the par. of St Philip, is one of the finest mansions in the Caribbean. It was built in 1820 for Samuel Hall Lord. Ragged Point, a lighthouse 15 m. from the cap., is generally the first landmark sighted on approaching B. N. Point lighthouse (7 m. from the cap.), built of iron, also commands an extensive ocean view. Welchman's Hall Gully and Cole's Cove are among the well-known natural features of the is. Other tns are Speightstown (pronounced Spikestown), 12 m. from the cap. and formerly a shipping place of importance, which is said to be built on the lands of one Wm Speight, a member of Governor Hawley's assembly in 1639; and The Hole or Hole Town on the W. coast, in which is a tercentenary monument commemorating the landing (unconfirmed by historical research) of a party from the *Olive Branch* in 1605.

See Sir Robert H. Schomburgk, *History of Barbados*, 1848; H. Darnell Davis, *Cavaliers and Roundheads in Barbados* (Georgetown), 1887; V. Harlow, *History of Barbados*, 1928, and *Christopher Codrington*, 1668-1710, 1928; Official Report, *Barbados*, 1954 and 1955, 1956.

Barbados Cherry, fruit of *Malpighia glabra*, resembling closely a cherry in size and appearance, but not in flavour. *M. urens* is the Cow Itch Cherry. They are found in the W. Indies.

Barbados Gooseberry, fruit of the *Fereakia aruleata*, is an oval, yellow, edible fruit which grows on a W. Indian cactus. The plant on which it grows has thick, flat leaves with hard spines and the flowers are showy and white.

Barbados Leg, another name for *Elephantiasis Arabum*.

Barbados Pride, see CAESALPINIA.

Barbara, St, the subject of a legend which tells of her martyrdom under Maximinus Thrax (235-8). Patron saint of pyrotechnicians, artillerymen, and many other kinds of craftsmen; her feast is on 4 Dec.

Barbara, in formal logic, is the first word

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of a useful and ingenious set of mnemonic lines which form a clue to the moods and their process of reduction in all the 4 figures. *Barbara* itself indicates that mood of the first figure which has all its propositions universal affirmatives. The lines are:

*Barbara, Celarent, Darii, Ferioque priors:
Cesare, Camenestres, Festino, Baroco,
secundae:
Tertia Darapti, Disamis, Datisi, Felap-
ton.
Bocardo, Ferison, habet: quarta insuper
addit
Bramantip, Camenes, Dimaris, Fesapo,
Fresison.*

The words printed in ordinary type are real Lat. words, signifying that 4 moods, whose artificial names are *Barbara*, *Celarent*, *Darii*, and *Ferio* belong to the first figure; that 4 others belong to the second; 6 more to the third; while the fourth figure contains 5 moods. Each artificial name contains 3 vowels, which indicate the propositions forming a valid mood; thus *CEIArEnt* signifies the mood of the first figure, which has E for a major premise, A for the minor, and E for the conclusion. The artificial words altogether contain exactly the combinations of vowels of the 24 valid moods selected out of the 44 possible ones. These mnemonic lines also contain indications of the mode in which each mood of the second, third, and fourth figures can be proved by *reduction* to a corresponding mood of the first figure. Logicians invented this curious system of artificial words at least 6 cents. ago. The device, however ingenious, is of a wholly unscientific character, but a knowledge of its construction and use has long been expected from the student of logic (q.v.).

Barbarea, genus of perennial herbs of the family Cruciferae, which are found in Europe, Asia, and America. *B. vulgaris*, yellow rocket, winter cress, or herb St Barbara, grows in Britain as a handsome border plant in gardens, and is used in spring salads. *B. praecox*, land cress, is common to France, Britain, and N. America and a salad plant.

Barbarian (Gk *barbaros*), term applied by the ancients (Greeks to peoples who did not speak their language. The word is probably onomatopoeic, since it represents the babble of a foreign tongue to the more highly cultured Greek. To the Greeks the whole world was divided into Hellenes and B.s. The Romans were included by the Greeks in this general classification. At a later stage in the world's hist., when Rome had risen to power, the word was used to signify such peoples as did not share the culture and civilisation of Rome. Gradually the word ceased to denote only a difference of tongue, and came to mean a difference of manners, customs, and culture. Thus the tribes and peoples outside the boundaries of the Rom. Empire were known as the B.s. and they eventually encompassed the fall of Rome. In its present-day usage the word B. is applied almost exclusively with the meaning of lacking

Barbarossa

in culture and civilisation. Anything rough, savage, and uncouth is said to be barbaric, and the possessor of such qualities is held to be a B.

Barbarossa, see FREDERICK I (Holy Rom. Emperor).

Barbarossa, Horuk, or Aroodje, and **Khair-ed-Din**, names of 2 Turkish corsairs who terrorised the Mediterranean during the early part of the 16th cent. The first named was b. at Mitylene c. 1474. He served the emir of Tunis and became commander of his fleet. In 1515 he took Algiers, but 3 years later the Arabs secured the help of Spain, and Horuk was defeated and killed by Gomarez, near Oran. His younger brother, **Khair-ed-Din**, took command, and with help from the Sultan Solymann II he captured Algiers (1519) and Tunis (1534). In 1536 he was appointed chief admiral of the Turkish fleet, and carried on his piratical warfare up and down the Mediterranean, both on land and at sea, plundering Port Mahon (Minorca), the Ionian Is., and Dalmatia and defeating the Christian powers in sev. sea fights. He obtained victories over the fleet of Emperor Charles V in the Gulf of Arta (1538), near Crete (1540), and off Algiers (1541). In 1543 he helped the French to regain Nice, and made a triumphal return to Constantinople, where he d. in 1546.

Barbaroux, Charles Jean Marie (1767-1794), Fr. revolutionary. b. Marseilles. He became a lawyer. When the revolution broke out he soon became a prominent member of the Girondist party, and was a member of the Convention. Though he voted for Louis XVI's death, he was an ardent opponent of Robespierre. Eventually he fled from Paris and tried to organise a rebellion against the gov. He was arrested at Bordeaux, after an ineffectual attempt to shoot himself. He was guillotined on 25 July 1794.

Barbary, general name for the most northerly portion of Africa, from Egypt to the Atlantic, and from the N. frontier of the Sahara to the Mediterranean. It thus includes Morocco, Fez, Algeria, Tunis, and Tripoli, together with Barca and Fezza. The name B. is derived from the name of its anc. inhab., usually called Berbers or Kabyles. In anc. times this part of Africa prospered under the dominion of Carthage. After the fall of Carthage it was under Rom. rule, had many flourishing cities, and was regarded as the prin. granary of Rome. After being overrun by the N. barbarians at the fall of Rome it was subdued by the Saracens and fl. under their rule as much as at any period of its hist. But the Saracenic gov. gradually became a prey to disorder and B. sank into a degraded condition. A number of Turks and renegades acquired it, and subjected it to brutal despotism. Since they could not compete with the European powers in war, they carried on an extensive system of marauding; and the 'B. pirates' were the terror of the merchants of the region. They were suppressed finally at the conquest of Algiers by the French. The occupants of B. are principally

Barbed

Bedonins, Jews, Turks, and the Fr. colonists in Algeria. For a fuller description of the climate, produce, etc., see the various countries comprised in the name B.

Barbary Ape (*Macaca sylvana*), belonging to the family of Primates, Cercopithecidae, the only monkey found alive in a wild state in Europe. It is tailless, an agile tree-climber, and feeds on fruit. It is a native of N. Africa and the Rock of Gibraltar.

Barbary Pirates, see BERBERS.

Barbary Sheep, **Aoudad**, or **Udad** (*Ammotragus lervia*), species of bovid closely related to the goats. It has powerful horns and a goat-like odour, but is distinguished from goats by its longer tail and the mane of long hair on the throat and upper parts of the forelegs. Found in Barbary and Kordofan in N. Africa.

Barbastelle, species of bat, found in England, France, and Germany, with hairy cheeks and lips.

Barbastro, Sp. tn in the prov. of Huesca, on both banks of the Vero. It has a 16th-cent. castle, and is the centre of an agric. dist. Pop. 7000.

Barbauld, Anna Letitia (1743-1825), poetess. b. Kilworth Harcourt, Leics, a sister of John Aikin (q.v.). In 1773 she pub. a collection of miscellaneous poems, which was well received, and in the following year married Rochemont Barbauld, a Fr. Protestant and dissenting minister. They conducted a school first at Palgrave in Suffolk, then at Hampstead. Meanwhile Mrs B. pub. *Hymns in Prose for Children*, 1781, followed by *Evenings at Home*, 1796, and ed. *Selections from the English Essayists*, *The Letters of Samuel Richardson*, and a 50-vol. collection of the Brit. novelists, with an introductory essay, 1810. Her husband had d. insane in 1808, but she continued to live and work in London. See G. A. Ellis, *A Memoir, Letters, and a Selection from the Writings of Anna Letitia Barbauld*, 1874.

Barbecue (Sp. *barbacoa*, from the Haitian), name given to a framework placed over a fire, on which was placed meat, etc., to be dried or smoked. Later the framework developed into a kind of gridiron on which whole animals could be roasted. In Cuba B. is used for the upper floor of a house, where grain, etc., is stored, and in the U.S.A. it is used to denote an open-air feast on a large scale. A modified form of B. is being introduced into England.

Barbed, term used in heraldry for an arrow with a pointed or jagged head; also for the 5 green sepals which appear between the 5 petals of the conventional heraldic rose.

Barbed Wire Act, 1893. Act which enables a local authority to serve notice in writing requiring the occupier of land adjoining a highway to abate the nuisance caused by barbed wire fencing if it be likely to cause injury to persons or animals lawfully using the highway. If he fail to abate the nuisance, a court of summary jurisdiction, on application by the local

authority, may order him to do so, and on failure to comply, the authority may execute the order and recover the cost from the occupier.

Barbel (Lat. *barba*, beard), name applied to the genus of fish known as *Barbus*, of the family Cyprinidae, allied to the carp and goldfish. It has 4 soft appendages from its mouth, and the third ray of the dorsal fin is long, bony, and serrated. It lives in fresh, usually muddy, water in Asia, Africa, and Europe. *B. barbus*, common to Europe, is a large, coarse fish, weighing 15 to 18 lb.

Barbellion, W. N. P., pseudonym of Bruce Frederick Cummings (1889-1919), biologist and writer, b. and educ. in Devon, son of a journalist. He began work as an assistant at the Brit. Marine Biological Association's laboratory at Plymouth and, later, was appointed to the entomological dept at the Brit. Museum. He suffered from ill health throughout his life in London, succumbing to sclerosis soon after being compelled to resign through illness. His *Journal of a Disappointed Man* (with preface by H. G. Wells), which was pub. shortly before his death, describes his early passion for natural hist. It is one of the great psychological revelations in Eng. autobiography. Posthumous works are *Enjoying Life and other Literary Remains*, 1919, and *A Last Diary*, to which is prefixed a memoir by A. J. Cummings, 1920.

Barber, Margaret Fairless, see FAIRLESS, MICHAEL.

Barber, Samuel (1910-), Amer. composer, b. at Westchester, Penn., studied at Philadelphia. His works include the ballet *Medea*, choral music, 2 symphonies, violin and cello concertos, and 2 string quartets, an *Adagio* from the 1st having won fame arranged for string orchestra.

Barber (Lat. *barba*, beard, through M.E. and Anglo-Fr. *barbour*), one who is occupied in shaving, hairdressing, and trimming the beard, etc. In former times the B.s were joined with surgeons. In France the B.-surgeons were a distinct body under Louis XIV, and in England the B.s were incorporated in 1461. They were united with the company of surgeons in the time of Henry VIII, and were allowed to let blood and to draw teeth; they were not separated from the surgeons until 1745. The fillet round the B.'s pole signifies the ribbon which was bound round the arm before bleeding.

Barber-surgeons, see ROYAL COLLEGE OF SURGEONS.

Barberini, It. family, originally from Florence, raised to a high rank among the Rom. nobility in consequence of the elevation of one of its members, Cardinal Maffeo Barberini, to the papal chair in 1623, when he assumed the name of Urban VIII (q.v.). Urban had 3 nephews, 2 of whom were made cardinals, and the third prefect of Rome, and they ultimately obtained the fief of Palestrina, which had formerly belonged to the Colonna family. The B. heiress eventually married a Colonna prince when the male line of the family died out in the

early 18th cent. In the palace of the B. at Palestrina is the celebrated mosaic taken out of the temple of Fortune at Praeneste. (See PALESTRINA.) The Palazzo B. at Rome is a vast structure, built by Bernini, and gives its name to the square before it. It contains a museum, a gallery of paintings, and a library, which was collected by Cardinal Francis B., one of the nephews of Urban VIII. The library is rich in valuable MSS.; its catalogue was printed at Rome in 1681, in 3 vols. folio.

Barberini Vase, see PORTLAND VASE.

Barberino di Mugello, It. tn. in Tuscany (q.v.), 16 m. N. of Florence (q.v.). It manufs. straw hats. At Cafaggiolo, near by, is a beautiful 15th-cent. villa of the Medici (q.v.). Pop. (com.) 13,000.

Barberry (*Berberis vulgaris*), species of Berberidaceae which is frequently found in Britain. The leaves of the shoot appear as spines having in their axils dwarf shoots which bear foliage leaves and flowers. The flowers grow on a long, pendent stalk; the berry is oval, and is sometimes made into jam. The presence of B. plants is productive of the fungus called rust which develops on grasses.

Barberton: 1. City in Ohio, U.S.A., near Akron. It manufs. matches, chemicals, porcelain, etc. Pop. 27,800.

2. Mining tn. of the Transvaal, situated 2878 ft above sea level on a side of the De Kaap valley. Gold was discovered in the De Kaap valley in 1875. It was a boom town in 1886 (white pop. 8000), and is now the centre of a prosperous agric. area, producing cotton, tobacco, citrus fruits, and most subtropical fruits. Formerly malarial, it is now a health resort. Asbestos, magnesite, nickel, and talc are mined locally. Pop.: White, 2070; Bantu, 3811; Coloured, 255; Asiatic, 292.

Barbesillium, see BARBEZIEUX.

Barbet (Lat. *barbatus*, bearded), name applied to various birds of the family Capitonidae common to tropical Africa, Asia, and America, because of the prominent stiff bristles about the mouth which assist them to catch insects. They are bright-coloured, and somewhat resemble the cuckoo in shape.

Barbette (Fr. dimin. of *barbe*), name given to the earthen terrace inside the parapet of a rampart, serving as a platform for cannon. This terrace has such an elevation that cannon can be fired over the parapet instead of through embrasures, thus giving a larger scope. When guns are thus mounted, they are said to be mounted in barbette. In the naval sense a B. is an armoured breastwork, fixed at no great height, behind which the heavy armament of a ship is mounted. The guns fire over the breastwork in the same way as over a B. on land, and are mounted on turntables, whilst the after-ends are protected by armoured hoods. The B. superseded other methods of firing heavy guns on board ship; the *Téméraire* in 1876 was the first Brit. iron-clad to be furnished with B.s.

Barbey d'Aurevilly, Jules Amédée (1808-89), Fr. novelist and critic, b.

Barbeyrac

Saint-Sauveur-le-Vicomte. In 1851 he went to Paris, where he helped to found the jour. *Le Réveil*. He was a sharp critic, opposed to the realistic trends of the 19th cent. Among his best novels are *Une Vieille Maîtresse*, 1851, *L'Ensorcelée*, 1854, and *Les Diaboliques* (short stories), 1874. His critical writings include *Les Œuvres et les hommes du XIX^e siècle*, 1861, *Portraits critiques*, 1863, and *Goethe et Diderot*, 1880. See J. Canu, *Barbeyrac d'Aurevilly*, 1945.

Barbeyrac, Jean (1674-1729), Fr. jurist, b. Béziers, of Calvinistic parents. He became teacher of *belles-lettres* in the Fr. college at Bern, 1697-1711; appointed by the senate of Bern to the chair of law and hist. at the academy of Lausanne, 1711; prof. of law at the univ. of Groningen, 1717, where he d. He made his reputation with *Traité du Jeu* (first ed. 1709). His other works include a trans. of Puffendorf's *Law of Nature and Nations*, 1712; a new version of Grotius's *De Jure Belli et Pacis*; and *Histoire des Anciens Traités*.

Barbezieux (ancet *Barbesillium*). Fr. tn in the dept of Charente, on a hill near the Tréfle. It has an old castle, now a museum and theatre. Eaux-de-vie, white wine, paper, and footwear are manuf. Pop. 4200.

Barbican, medieval fortification, usually a small round tower for the station of an advanced guard, placed just before the outward gate of the castle yard, or ballium. In cities or tns the B. was a watch-tower, placed at some important point of the circumvallation. It had sometimes a ditch and drawbridge of its own. The street of London called B. was so called because of its vicinity to a tower of this sort attached to the city wall. B. was a term likewise used for a hole in the wall of a city or castle, through which arrows and darts were shot.

Barbier, Antoine Alexandre (1765-1825), Fr. bibliographer, b. Coulommiers. He was a member of the council for the preservation of scientific and artistic objects of value. He was instrumental in saving from destruction many collections of books, which had been stored after the suppression of various civil and eccles. establs., and placing them in public libraries. He was librarian to Napoleon, and administrator of the Crown libraries until 1822.

Barbier, Henri Auguste (1805-82), Fr. poet, b. Paris. He was a voluminous writer, mainly of political satire. The work by which he is best known is his *Iambes*, 1831, a series of satirical poems in which he paints the life of his time in a rugged, forcible style. Amongst his other works may be mentioned *Lazare*, 1833, dealing with the oppressed condition of the Eng. people, and *Il Piano*, 1833, which is concerned with the misery of Italy.

Barbier, Paul Jules (1825-1901), Fr. dramatic author, b. Paris. He was first known as a poet. Later he wrote many dramas and comedies, often in collaboration with other authors, and his first 2 plays were performed at the Comédie

Barbiturates

Française. His best work was, however, done as a librettist; he wrote librettos for Thomas, Meyerbeer, and especially Gounod (*Faust*, *Roméo et Juliette*, *La Colombe*).

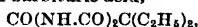
Barbieri, Francisco Asenjo (1823-94), Sp. composer and musicologist, b. Madrid. As a scholar he conducted researches into ancet musical documents, especially the books of the players of the old Sp. instrument, the *vihuela*, and the *cancioneros* (collections of songs of the 15th and 16th cents). He pub. annotated transcriptions of the so-called *Cancionero de Palacio* and *Cancionero musical de Barbieri*, 1890. After a precarious existence in various humble musical employments he made a success as a composer of national comic operas. *El Barberillo de Lavapiés* and *Pan y Toros* have the greatest significance for Sp. music. In them, by far his most important work, 'he saved from oblivion a treasury of rhythmic and melodic elements characteristic of the national folk-lore of the 18th cent., thus laying the foundation of a distinctive national school' (Pedro Morales). Other comic operas are *El diablo cojuelo*, *Gloria y peluca*, *Los carboneros*, and *Un loro y una lechuza*.

Barbieri, Giovanni Francesco, see GUERCINO.

Barbirolli, Sir John (1899-), Eng. conductor, b. London, of It. and Fr. parentage. He was educ. at the Royal Academy of Music; made his first public appearance as violoncello soloist at Queen's Hall, 1911; toured Brit. Isles and Europe as member of the International String Quartet; founded and conducted B. Chamber Orchestra, 1925, and joined Brit. National Opera Co. as conductor, 1926. He was conductor and music director of New York Philharmonic Symphony Orchestra, 1937-42, and has been conductor of Hallé Orchestra, Manchester, since 1943. He has pub. sev. arrangements of old classical music. Knighted 1949.

Barbiton, name of a musical instrument in use among the ancients. It was a kind of lute.

Barbitone (Veronal), known chemically as diethyl barbituric acid,



is a widely used hypnotic or sleep-producing drug in doses of 5 gr. (0.3 gm.). It is not very poisonous, but it is excreted slowly from the body, and if the kidneys and bowels are not acting efficiently a dangerous accumulation may occur. It should be taken only under medical supervision. See also BARBITURATES. It is prepared by acting upon urea (q.v.) with diethylnalonic ester.

Barbiturates, salts and derivatives of barbituric acid. The numerous B. have generally the same properties but differ in dosage, length of action, and the margin of safety between the therapeutic dose and the poisonous dose. As a general rule the long-acting B. take effect slowly and short-acting quickly. The sodium salts are more soluble and therefore more rapid in action. Because of their

characteristics B. are classified into (1) *Long acting*. (2) *Intermediate acting*. (3) *Short acting*. (4) *Ultra short acting*. The first group includes barbitone (q.v.), phenobarbitone (q.v.), and methylphenobarbitone. Their action is not apparent for an hour or more and lasts for 6 to 10 hrs. The second group includes allobarbitone, butobarbitone, and amylobarbitone. They act within 30 min. and are effective for 5 to 6 hrs. They are not so prone to leave a 'hangover' as those of the first group and are widely used in the treatment of insomnia. In the third group are cyclobarbitone and pentobarbitone. They are usually effective within 15 min. and their action lasts for 2 to 3 hrs. They are often employed in pre-operative medication. In the fourth group are thiopentone and hexobarbitone. They are usually given by intravenous injection and their action is instantaneous and lasts up to 1 hr. These ultra-short-acting B. are used for anaesthetic purposes for minor operations, or as a means of inducing anaesthesia preparatory to using an inhalation anaesthetic in major operations (see ANAESTHESIA). The B. are effective sedatives and hypnotics and are given for insomnia, to allay anxiety, and to calm nervousness. They are given in epilepsy (q.v.). By themselves they have no effect on pain but are sometimes used in combination with analgesics when insomnia is due to pain. The B. are specific antidotes to poisoning by strychnine (q.v.). Barbiturate poisoning is characterised by headache, giddiness, and muscular twitching, followed by sleep which proceeds to coma. The breathing becomes shallow and slow and death may ensue from lung complications and respiratory failure. B. have a cumulative action and chronic poisoning may occur from prolonged administration. Symptoms of chronic poisoning are headache, visual disturbances, weakness, and anaemia. Mental and moral changes with depressive tendencies may be produced. The antidotes to acute barbiturate poisoning are respiratory stimulants, together with artificial respiration. Recently a drug called 'buenegrade' has been found to be an effective antidote to barbiturate poisoning. In the case of poisoning from a long-acting barbiturate the stomach should be washed out. In chronic poisoning the drug should be stopped.

Barbizon, Fr. vil. near the forest of Fontainebleau, which gave its name to the Barbizon school of artists. This was a group of landscape painters (in outlook midway between the romantics and realists of the 19th cent.). Linked by friendship and poverty, and inspired by the Eng. landscapes (notably those of Constable shown in France in 1824), they turned their back on urban life and returned to nature' (c. 1830). Daubigny, Diaz, Dupré and Théodore Rousseau were the nucleus of the group but Corot and Millet (q.v.) became associated with them. Their beautiful pictures eventually gave B. great prestige and transformed the humble vil. into a flourishing 'art colony.'

Barbon, Praise-God, see BAREBONES PARLIAMENT.

Barbou, name of a family of Fr. printers, who long rendered themselves famous for the correctness as well as elegance of the works which issued from their presses.

Jean B., the first of the name who is known, was settled at Lyons, where he printed the works of Clément Marot, 1539. His descendants continued to exercise their art for more than 2 cents. His son, Hugh B., opened his press at Limoges, where his *Cicero's Letters to Atticus* was issued in 1580. Two brothers of a later generation settled in Paris, Jean-Joseph B. in 1704, and Joseph B. in 1717, the former dying in 1752 and the latter in 1727. It was between 1750 and 1790 when under the management of Joseph Gérard B., a nephew of the 2 brothers last mentioned, who had taken over the printing office from his Uncle Joseph's widow, that the press reached its highest point. He issued a series of classics which bears his name. The small format of the books rivalled the Elzevirs in elegance.

Barbour, John (c. 1320-95), Brit. poet. He took holy orders, and was promoted by King David II to the Archdeaconry of Aberdeen about the year 1356. He obtained permission from Edward III in 1357 to reside in Oxford for a time for the purpose of studying, and similar permission to study and travel in England was granted in 1365 and 1368. In 1373 he was clerk of audit to the household of King Robert II and later became one of the auditors of the exchequer. His fame rests on *The Brus*, which he completed about 1376. It is an epic poem, written in octosyllabic verse, recording the adventures of Robert the Bruce and his companion, Sir James Douglas. It is written with great spirit; the style is clear and simple and the language more 'modern' than that of his contemporaries. The Edinburgh ed. (1571) is the first printed copy extant. The best eds. are by Skeat (1870-7) (with corrections, 1893-4), and *Barbour's Bruce*, ed. by W. M. MacKenzie, 1909. See G. Neilson, *John Barbour, Poet and Translator*, 1900.

Barbuda, is. of the Brit. W. Indies, situated in 17° 33' N. and 61° 43' W. It is 62 sq. m. in area, and is a dependency of Antigua, Leeward Is., being formerly in possession of the Codrington family (1691-1872). They gave their name to its only vil. It is densely wooded, and has a lagoon on the W. side. Produces sea is. cotton, sugar, pepper, and charcoal, and exports phosphate of lime and salt. There is good shooting and fishing. Pop. 980.

Barbusse, Henri (1874-1935), Fr. poet, novelist, and journalist. b. Asnières; in 1910 he became editor of *Je Sais Tout*. He served as an infantryman in the First World War, gaining the Croix de Guerre. After the war he joined the Communist party, and later became the editor of *L'Humanité*. His book *Le Feu*, 1916, was awarded the Prix Goncourt in 1917. It described his war experiences,

showing all the horrors of war. Other works: *Pleureuses* (poetry), 1895; *Les Suppliants*, 1903; *L'Enfer*, 1908; *Nous autres*, 1914; *Lu Lueur dans l'abîme*, 1920; *Les Enchaînements*, 1925; *Manifeste aux intellectuels*, 1927; *Staline*, 1934.

Barby, Ger. tn in the dist. of Magdeburg, on the Elbe (q.v.), 16 m. SE. of Magdeburg (q.v.). It is a mkt tn and has manufs. of agric. machinery. Pop. 8000.

Barcarolle, from *barcarola*, song in the Venetian dialect, sung by the gondoliers at Venice. Formerly most of the gondoliers

Barcelona: 1. Sp. prov. in Catalonia (q.v.), with a coastline on the Mediterranean. It is, in general, mountainous, the N. and centre of the prov. containing spurs of the Pyrenees (q.v.). Olives are grown, and the valleys and coastal plains produce fruit and vines. Area 2970 sq. m.; pop. 2,314,200.

2. (anc. **Barcino**; later **Barcinona**), Sp. seaport, cap. of the prov. of B., on the Mediterranean. It stands in a rich plain between the R.s Besos and Llobregat. B. was probably founded by the Carthaginians, and its name is said to derive



Paul Popper

BARCELONA

Puerta de la Paz and the Avenue of the Ramblas.

knew by heart the greater portion of *Jerusalemme liberata* of Tasso, and sang it in alternate stanzas. The old B. was sung in parts, at stern and stern of the same boat. The term B. may also be used for an imitation of the song of a gondolier. The well-known airs *La biondina in gondolella* and *O pescator dell'onda* are pleasing specimens of this species of song. Three of Mendelssohn's *Songs without Words*, and Chopin's piano B. are famous examples of the B. idealised as piano pieces, and Fauré wrote 13 of them. Sev. operas contain B.s where the situation is appropriate; the most famous if not the finest is that in Offenbach's *Tales of Hoffmann*.

Barcellona-Pozzo di Gotto, tn in Sicily (q.v.), 14 m. WSW. of Messina (q.v.). It lies on the fertile N. coastal plain, and is a centre for fruit, wine, cereals, and olive oil. There are also sulphur baths. Pop. 30,000.

from that of Hamilcar Barca (q.v.). It became a Rom. colony, and was conquered by the Visigoths (see GOTHs) in 415, and by the Moors in 713. In 762 it became an independent co.; the Catalan (see CATALONIA) dynasty originated here, and B. remained a cap. after the union of Catalonia with Aragón (q.v.). In the Middle Ages it was a great port, rivaling Venice and Genoa (see CONSULATE OF THE SEA), although later eclipsed for a time by Seville. In 1640 it revolted against Philip IV, and, later, against Philip V. It was taken by the English in 1706, by the French in 1714, and was occupied by the French again 1808-14. In more recent times it has been a centre of political agitation. It was involved in the Carlist (see CARLISTS) troubles, and experienced a Progressist insurrection in 1856 and a Federalist insurrection in 1874. In 1916 there were again disturbances, in 1923 there was a general strike,

and in 1925 B. was for a time under martial law. During the civil war of 1936-9 the city suffered through bombardment and blockade. Towards the end of 1937 it replaced Valencia as the cap. of the republican gov., and in Mar. 1938, concurrently with the advance of the insurgent troops on the Aragón front, was severely bombed from the air. This led to Anglo-Fr. protests. In Jan. 1939 republican resistance in Catalonia collapsed, and the republicans in B. surrendered on 26 Jan. B. is the second city of Spain. It was formerly surrounded by walls, but those were pulled down in the 18th cent., and the city replanned. The 'old tn' has narrow, irregular streets, the main axis of which is formed by the *Ramblas*, a series of successive tree-lined avenues. At the N. end of the *Ramblas* is the Plaza de Cataluña, the largest square in B., and the heart of the city. The 'new tn,' the *Ensanche*, on the N. side of the city, has wide, symmetrical streets and modern buildings. The third section of the city is composed of vils. which have become engulfed during the city's expansion. There is a beach at Barceloneta, near the port. There are many notable buildings, including a Gothic cathedral (begun 1298), the anct palace of the Kings of Aragón, the 15th-cent. Palacio de Diputación, and the 14th-cent. monastery of Pedralbes. B. is the metropolis of Catalan literature and art, and has valuable libraries and museums. Its univ. (1450) and Madrid Univ. are the only univs. In the country permitted to grant doctorates. It is the leading commercial and industrial tn of Spain, and has, since the end of the Second World War, regained its great importance as a Mediterranean port. The prin. manufs are textiles, paper, machinery, and leather goods. Pop. 1,335,450.

3. City and port of Venezuela; the cap. of Anzotegui state. 12 m. by rail from Guanta on the Caribbean Sea, its port; a stock-raising and commercial centre, it has salt works and coal mines, and exports coffee, sugar, and cacao. Pop. 26,450.

Barchamps, Charles Melchior Artus, Marquis de (1760-93), Fr. Royalist leader in the revolt of La Vendée. He took part in the Amer. War of Independence. On the outbreak of the revolution he returned to his château and remained in retirement until the risings in La Vendée. To his military skill and judgment much of the success of the Vendéans was due. Dissensions broke out amongst them, and finally, at the battle between revolutionaries and royalists at Cholet in 1793, B. was mortally wounded.

Barhan, crescent-shaped sand dune characteristic of sandy wastes exposed to winds which remain constant in direction. A B. is crescentic in ground plan, the horns extending downwind. Individual B.s move down wind as sand grains are blown up the windward surfaces of the dunes and slip down the leesides. In this way dunes may obstruct communications in deserts and debouch on to fertile land or property. Dunes have been fixed by

the planting of suitable plants such as marram grass or tamarisk, but this is not always feasible.

Barcino, see **BARCELONA**.

Barcinona, see **BARCELONA**.

Barckhausia, Barkhausia, or Borkhausia (after Moritz Borkhausen, a German who pub. a botanical work in 1790), name now given to a section of *Crepis* of the Compositae; including *C. foetida*, Stinking Hawk's-beard; *C. taraxacifolia*, Beaked Hawk's-beard; and *C. setosa*, Bristly Hawk's-beard; all found in Britain, though only the first is a true native.

Barclay, Alexander (c. 1475-1552), poet, b. probably in Scotland, although most of his life was spent in England. He became chaplain of the college of Ottery St Mary, Devon, later a monk at Ely and Canterbury, and the rector of All Hallows, Lombard Street, London. His place in literature rests on *The Ship of Fools*, 1509, an adaptation in verse of Sebastian Brant's *Narrenschiff*, 1494, a satire on the social vices of the age. His other works are 5 *Eglogues*, c. 1514, the earliest Eng. pastorals, *The Myrrour of Good Maners*, 1523, and a trans. of Sallust's *Jugurtha*, together with other trans. See T. H. Jamieson (ed.), *The Ship of Fools* (2 vols), 1874; J. W. Fairholt (ed.), *The Citizen and Uplandishman* (5th ed.), 1847; *The Myrrour of Good Maners*, Spenser Society reprint, 1885; A. Pompen, *The English Versions of the Ship of Fools*, 1925.

Barclay, Florence Louisa (1862-1921), novelist, b. Limpfield, Surrey; daughter of Samuel B. Charlesworth, rector of that par. In 1881 she married Charles Wright B., vicar of Little Anwell, Herts; she d. at Limpfield. Her works include *The Rosary*, 1909, *The Following of the Star*, 1911, *The Mistress of Shenstone*, 1911, *Through the Postern Gate*, 1912, *The Broken Halo*, 1913, *The Wall of Partition*, 1914, and *Returned Empty*, 1920. See life by one of her daughters.

Barclay, John (1582-1621), Brit. satirist, b. Franco, son of William B. (q.v.). He came to London with his father about 1603. His best-known works are the *Euphormionis Satyricom*, 1603-7, a Lat. satire in the manner of Petronius, directed against the Jesuits, and *Argenis*, a political romance somewhat on the lines of More's *Utopia*. He was subsequently reconciled to Catholicism, and d. in Rome. See Jules Dukas, *Satyricom*, Paris, 1880, and Dupond, *L'Argenis de Barclay*, Paris, 1875.

Barclay, John (1734-98), b. Perthshire, educ. at St Andrews; became assistant minister at Fettercairn, 1765. His opinions offended the Presbytery, which was supported by the General Assembly, and B. left the Church and founded the sect of the Bereans (q.v.). See memoir in collected works by Thomson and Macmillan, 1852.

Barclay, John (1758-1826), surgeon, nephew of the founder of the Bereans, b. Perthshire; studied medicine at St Andrews and Edinburgh; M.D., 1796. In 1797 he began to teach anatomy on his own account, and in 1804 his course of

lectures was 'recognised' by the College of Surgeons in Edinburgh. His lectures attained great popularity and his writings gave him a considerable reputation. They included *Muscular Motions of the Human Body*, 1808, and *Engravings Representing the Bones of the Human Skeleton*, 1819. He collected a valuable museum of human and comparative anatomy.

Barclay, Robert (1648-90), theologian, b. Gordonstown, Morayshire. His father, Col. David B. of Ury, had served under Gustavus Adolphus. Robert was educ. at the Scots College, Paris. Joining the Quaker Society with his father in 1666, he was a strong controversialist with opponents, and suffered persecution. His *Apology for the True Christian Divinity* (Lat. 1676, Eng. 1678) is a standard work of Quaker doctrine. He travelled with Penn and Fox, and was made nominal governor of the Quaker settlement of E. New Jersey by James II, 1682. He d. at the family estate of Ury. Life by M. C. Cadbury, 1912.

Barclay, Sir Thomas (1853-1941), lawyer, b. Dunfermline, educ. at Univ. College, London, and at the univs. of Paris and Jena. In 1876 he became Paris correspondent to *The Times*, was called to the Bar in 1881, and in the following year gave up journalism to practise Fr. law. His life was devoted to fostering amicable relations between Great Britain and other countries, and he travelled widely for that purpose. He founded the Franco-Scottish Society in 1895, and the International Brotherhood Alliance in 1905. He was knighted in 1904. He was an authority on international law, and his numerous works include *Problems of International Practice and Diplomacy*, 1907, *International Law and Practice*, 1917, *New Methods for Adjustment of International Disputes*, 1918, *Law and Usage of War*, 1918, *Collapse and Reconstruction*, 1919, and *Wisdom of Lang-sin*, 1927.

Barclay, William (1546-1608), Scottish jurist, father of John B. (q.v.), the author of *Argenis*, studied law under Cujas at Bourges, and became prof. of law at the univ. of Pont-à-Mousson. In 1605 he had a dispute with the Jesuits and went to England, but in 1604 was prof. of law at Angers, where he d. His chief legal work is *De Regno et Regali Potestate*, 1600; his attack on the temporal power of the Pope, *De Potestate Papae*, was ed. by his son, 1609, and was answered by Bellarmine's *De Potestate Summi Pontificis*, 1610.

Barclay de Tolly, Michael Andreas (1761-1818), Russian general, b. in Livonia, of an old Scottish family settled there in 17th cent.; distinguished himself against the Turks (1788), the Swedes (1790), and in Poland (1794). He fought (1806) as major-general at Pultusk and at Eylau, where he lost an arm. In 1808-9 he commanded in Finland, and his daring march across the ice of the Gulf of Bothnia and capture of Umeå are famous. Minister of War (1810-13), he, and Bagration commanded the 2 armies

against Napoleon, 1812. He was superseded by Kutusov after his defeat at Smolensk and left the army. He resumed command at Dresden, Kulm, and Leipzig, and was made field marshal, 1814, and Prince Bogdanovich, 1815.

Barclays Bank, one of the 5 big banks or banking amalgamations of Great Britain. The nucleus of the present bank dates back to the 18th cent., the founder of the London business being John Frearno, a goldsmith, whose son and successor, Joseph, took James Barclay, a brother-in-law, into partnership, since when the Barclay family have always had a member in the business. B. B. was registered in 1896 as Barclay & Co. Ltd, to acquire the banking businesses of Barclay, Bevan, Tritton, Bouverie & Co., and Ransom of London, and of Gurney & Co. of Norwich, some of which banks were founded in the 17th cent. Other concerns, such as United Counties Bank and the London and Provincial and South Western Bank, were absorbed during the First World War, and altogether over 40 banks have been merged in the amalgamation, the name being changed to the present style in 1917. B. B. also controls B. B. (Dominion, Colonial, and Overseas), which latter was incorporated in 1836 as the Colonial Bank and re-incorporated in 1925 under its present name. The bank does large business in overseas investments.

Bar-coohba, or **Bar-kokba**, Heb., 'son of a star' (Num. xxiv. 17), name of one Simon or Simeon, leader of the last Jewish revolt from Rome (AD 132-5). Nothing is known of his origin; the rabbi Aquiba recognised him as the Messiah. He was for a time successful, retaking Jerusalem. The Romans, under Julius Severus, captured Jerusalem (135), when B. was slain; the rebellion was ended with great slaughter at Bether. To later rabbinical writers he is known as Bar-coziba, 'son of deceit.'

Barcoo River, see COOPER'S CREEK.
Barcroft, Sir Joseph (1872-1947), physiologist, b. at Newry, Co. Down, and educ. at York and Cambridge; graduated 1893. He was lecturer and demonstrator at Cambridge for many years, and was appointed prof. of physiology, 1926-37. In 1941 he became director of the Unit of Animal Physiology, Agric. Research Council, and held this post until his death. B. devised an apparatus for analysis of the blood gases and did important research on the oxygen-carrying function of haemoglobin. He evolved the theory of the div. of the blood into circulating blood and depot blood, studied the physiology of the foetus, especially in sheep, and wrote *The Respiratory Function of the Blood*, 1914, *Features in the Architecture of Physiological Function*, 1934, and *Researches on Pre-Natal Life*, vol. 1, 1946. He was knighted in 1935. See life by K. J. Franklin, 1953.

Bard, name which Celtic peoples applied to their poets, singers, and minstrels. It appears in the form *bardoi* in Gk writers

as early as the 1st cent. BC, when poetry would seem to be associated with the religious education of the Druids. After the christianising of Britain and during the long struggle of the Welsh against the English the prophetic and exhortatory function of the Druid was taken up by the bard, and as the Romans invaded Anglesey under Suetonius Paulinus to suppress Druidism (the main source of unyielding resistance to Rome), so the Eng. kings Edward I and Henry IV made edicts against the Welsh B.s because of their influence on the native princes in their bitter struggle for independence. The 6th-cent. monk Gildas severely censures King Maelgwn Gwynedd for listening too much to the flattery of the B.s whom he regaled with mead and wine at his court. The laws of King Hywel Dda prove that in Wales, as early as the 10th cent., the B. was afforded a place of honour at the King's court. The Pencerdd, or chief B., won this privilege in some form of poetic contest which entitled the victor to a chair of honour among the royal officers for the rest of his life. Only a free man was eligible for the bardic office. His function was to praise God, to extol his lord's prowess in battle and his wisdom and generosity in peace, and to compose his elegy. When appointed, the king gave him the harp, which was the perquisite of his office. Next to the Pencerdd ranked the *Bardd Teulu*, or Bard of the Household, who entertained the Household Guards and lodged at their marshal's house, which was the biggest house next to that of the king. If the queen wished to be entertained in her apartment, the *Bardd Teulu* should sing her up to three songs quietly so as not to disturb the Pencerdd singing in hall!

The third grade mentioned in King Hywel's Code are the *Cerddorion*, or minstrels (*joculatores* according to the Lat. trans. of the Code). They would appear to be the ancestors of the jesters who were so popular in medieval halls. Tradition concerning the threefold order and official status of the Welsh B.s survived to the end of the Middle Ages, when the patronage of the independent princes was followed by the patronage of gentry of the royal blood. The B. was now given a *Ciers Clera*, or recognised circuit of the halls of a number of patrons once every three years, as he no longer resided as an official at one prince's court. He was expected to be an expert in the genealogy of the ancient houses on his circuit as well as a worthy poet.

Here mention must be made of an inferior sort of B.s or entertainers who also used to go about on begging circuits. They were called *lerwyr*, or *I'ŵlŵr*, and they form the Welsh counterpart of the continental *Cleri* or *Clerici vagantes*, or *Goliardi*. Until the 16th cent. their work was not considered worth writing down, but there can be no doubt that they left their influence on the popular *penillion* or folk poetry of Wales.

The next official attempt at regularising the bardic order is that of the commissioned *Caoerwys Eisteddfodau* of 1523

and 1568, which recognised and approved a system of bardic apprenticeship in three grades: (1) *Disgybl Ysbâs* (Student over a short space of time); (2) *Disgybl Disgyblaidd* (Disciplined student); (3) *Disgybl Pencerdddaidd* (Student for the title of Chief B.). Qualified students, after consultation with their teachers the Chief B.s, were licensed to make a circuit of the halls of the gentry at Christmas, Easter, and Whitsuntide. Any unqualified B.s going on circuit and begging patronage were henceforth to be counted 'vagabonds.'

Despite these attempts at restoring order under royal warrant, the formal bardic system was already disintegrating, and the next cent. produced a new type of Welsh poet, the gentleman writer whose independence of patronage allowed him to sing occasional and satirical verse to his heart's content, grafting lively, contemporary language on to traditional archaic verse forms. These forms were revived and jealously guarded in their classical style by the antiquarian scholars and learned poets of the 18th cent. and they provide the strict alliterative pattern on which the Chair B. of the National Eisteddfod must sing his ode to this day. See EISTEDDFOD and GORSENI.

Bardějov (Ger. *Bartfeld*), Czechoslovakia in the region of Prešov (q.v.), on the Tapola. The first general Protestant synod of Hungary met here. It has a 13th-cent. Gothic church and a 15th-cent. Rathaus, now a museum. There are chalybeate springs near by. Pop. 6600.

Bardesanes (AD 154-222) (*Bar Daisan*, son of Daisan, a riv.), called the 'last of the Gnostics,' Syrian theologian, b. Edessa. For some time he lived at the court of Abgar; but when Edessa was taken by Caracalla (217) he fled into Armenia. He maintained that evil was the revolt of matter against spirit, but held that the devil was an independent spirit. He denied the doctrine of the resurrection of the body, and preached that Christ's body was not living flesh, but an illusory likeness sent by God.

Bardi, lt. tn in Emilia-Romagna (q.v.), 31 m. SW. of Parma (q.v.). Pop. 7000.

Bardia, vil. on the N. coast of Africa, in the prov. of Cyrenaica, about 60 m. E. of Tobruk. It came into prominence during the Second World War when, on 19 Dec. 1940, a Brit. force captured it from the Italians. The Germans, however, retook it on 12 April 1941. B. was recaptured by the Allies in Nov. 1942.

Bardii, Christoph Gottfried (1761-1808), Ger. philosopher, b. Blaubeuren in Württemberg. He became a prof. of philosophy at Stuttgart, and as an exponent of rational realism he anticipated Hegel and Schelling. His chief work, in which he criticised Kant, is the *Grundriss der Ersten Logik*, 1800.

Bardowiek, Ger. vil. in the Land of Lower Saxony (q.v.), 70 m. NNE. of Hanover (q.v.). It was a trading post estab. by Charlemagne (q.v.), and had a cathedral which was destroyed by Henry the Lion (q.v.) in 1189. The cathedral

ruins are incorporated in a 14th-cent. Gothic church. Pop. 2200.

Bardsey, is. off Caernarvonshire, N. Wales, about 2 m. long by 1 m. broad. It is only accessible on the SE. side, where there is a small well-sheltered harbour. B. (or Bards' Ey, the Isle of Bards) was, according to legend, the last retreat of the Welsh bards. There was formerly an abbey, which was suppressed by Henry VIII. Numerous graves lined with stone, a large building, said to have been the abbot's lodge, and a ruined chapel or oratory are the only remains. Pop. 14.

Barbones Parliament, name of the 'Little Parliament' (4 July to 12 Dec. 1653), summoned by Cromwell after his violent dissolution of the 'rump' of the Long Parliament. It consisted of selected nominees of the congregations in each co. Its unruliness and incapacity led to its dissolution at the request of the moderates. The name, given to it by its opponents, is due to the number for London, Praise-God Barbon or B. (c. 1596-1679), a rich leather-seller and 'fifth monarchy' man. He does not seem to have taken any prominent part in the parliament. See H. A. Glass, *The Barbones Parliament*, 1899.

Barège, gauze-like fabric, used for women's dresses. It is a mixture of silk and worsted, or cotton and worsted, and is generally produced in light colours. The best quality is manuf. in France, where it is called *crêpe-de-barège*, from the tn Barèges, where it was first made; also produced at Bagnères de Bigorre.

Barèges, Fr. spa. in the dept of Hautes-Pyrénées, on the Bastan. It has warm sulphur springs, a military hospital, and is a centre for winter sports. The fabric barège was originally made here. Pop. 200.

Barilly, one of the prin. cities (pop. 208,628) of Uttar Pradesh, India, and cap. of the former Rohilkhand. It is a centre of much industry and has a college of the first rank dating back a hundred years.

Barents, Willem (d. 1597). Dutch explorer and navigator. He made 3 voyages in search of the NE. passage in 1594-6, and d. in Novaya Zemlya. De Veer's *True Description of Three Voyages by the North East* (of Willem B.) was ed. by C. T. Becke for the Hakluyt Society in 1853.

Barents Sea, that part of the Arctic Ocean which lies between the European mainland, Novaya Zemlya, Zemlya Frantsa Iosifa, and Spitsbergen. Its average depth is 100 fathoms. See F. Nansen, *The Norwegian North Polar Expedition*, 1900-6.

Barentsøya (Barents Island), is. in the E. of the Spitsbergen Archipelago, named after Willem Barents (q.v.).

Barère de Vieuzac, Bertrand (1755-1841). Fr. revolutionary, b. Tarbes; he became a lawyer and was elected as deputy for Bigorre to the States-General, 1789, and reported the debates in his paper, the *Point du jour*. As deputy for Hautes-Pyrénées to the National Convention, 1792, he was at first moderate in

his views, but later voted for the death of the king. He closed his speech with the phrase, 'The tree of liberty does not grow if it be not watered with the blood of kings.' He was a member of the first and second Committees of Public Safety, 1793, first supporting Robespierre, but turning against him at his fall. He was imprisoned after the Terror, but escaped. He was employed by Napoleon, turned Royalist in 1814, was exiled as a royalist in 1815, and allowed to return to France in 1830. He was the last survivor of the Committee of Public Safety. See his memoirs (Eng. trans.), 1896.

Barotti, Giuseppe (1719-89), It. writer, b. Turin. He came to London in 1751 as a teacher of Italian, he became secretary to the Royal Academy, and pub. the *Italian Library* (1757). He was a member of Dr. Johnson's circle, and figures in Boswell's *Life*. His jour., *Frustra Letteraria* (Venice, 1763-5), was marked by bitter but independent criticism. His *Dictionary and Grammar of the Italian Language* was in use all through the 18th cent. He also wrote *Lettere Famigliari* and a *Discours sur Shakespeare* in which he defended him against the criticism of Voltaire.

Barfleur, Fr. seaport and resort in the dept of La Manche, 15 m. E. of Cherbourg on the Cotentin peninsula. It was an important harbour for the Channel passage to England in the Middle Ages. The *White Ship* sank off the port with Henry I's only son Wm. Off Cape B. was fought the first of the series of naval battles between Tourville and Russell, May 1692, known in Eng. hist. as the battle of La Hogue (q.v.). The Cape B. lighthouse is 233 ft high. Pop. 1000.

Barfurush, see BABOL.

Barga, It. tn in Tuscan (q.v.), 16 m. N. of Lucca (q.v.). It is in the Serchio valley, and has many unct. buildings, including a beautiful Romanesque cathedral. Paper is manuf. Pop. 10,000.

Bargagli, Scipione (1540-1612), It. writer, b. at Siena, in Tuscany, of a patrician family. He became distinguished as an elegant writer. B.'s prin. works are *I Trattenimenti* (Venice, 1587), which by some is called B.'s best novel; *Dell' Imprese* (Venice, 1594), concerning the origin and symbolic language of devices and mottoes in the ages of chivalry; and *Il Turamino, ovvero del Parlare e dello Scrivere Senese* (Siena, 1602), a dialogue on the dialects of Tuscany, especially that of Siena. B. wrote other minor works both in prose and verse.

Bargagli, Girolamo (1537-86), his brother, who was a prof. of law in his native city, wrote a book called *Dialogo dei Giuochi che nelle Veggie Senesi si usano di fare* (Siena, 1572), which is an explanation of the numerous social games played in Italy among friendly parties.

Bargain and Sale, in law, a form of conveyance of real property now obsolete. It was one of the means by which an owner could avoid the feudal restrictions on the disposition of land. 'Livery of seisin,' i.e. actual open delivery of land, alone gave the legal title. If A bargained

to sell land to B, and B gave even nominal consideration, the courts gave B the equitable, i.e. beneficial, ownership. The Statute of Uses, 1535, transferred the legal title to the bargainee, thus allowing an easy method of secret conveyance. To prevent this, by the Statute of Enrolments, 1835, all such conveyances were to be by deed publicly enrolled. This was also evaded by conveyance by 'lease and release.' The Real Property Act, 1845, did away with the necessity of both these forms.

Barge, term applied to large flat bottomed boats used for the carriage of

projecting roof of a gable, covering the rafters and protecting them from weather. When elaborately carved, as in the 14th and 15th cents., they form an ornamental feature of the roof. Original B.s of this date are sometimes to be seen on the gables of porches of churches and on lighthouses. The barge course is that part of the tiling of a roof which projects over the gable end of a building.

Barham, Charles Middleton, 1st Baron (1726-1813), admiral, b. Leith. He joined the navy in 1745 and became an admiral, 1795. He was made first lord of the admiralty 1805-6, and raised to



OXFORD UNIVERSITY COLLEGE BARGES

heavy goods on canals or rivers; for this purpose they are usually towed; when employed for the transshipment of cargo from larger vessels to shore, or vice versa, they are termed lighters; dumb B.s are steered with an oar and drift with the tide. The B.s of the Great Lakes and E. coast of N. America run to great size, carrying over 3000 tons of cargo. The state B. is an ornamented vessel with a compartment for passengers in the stern, and is rowed by a crew of 10 or more oars. In former days the Lord Mayor's procession was rowed on the Thames in his state B. with those of the different livery companies. The royal state B. is manned by the queen's water-men. The modern house-boat is a development of the B., but is moored permanently at a river bank. Similar are the B.s at Oxford used as the H.Q. of the college rowing clubs. B.s are also special boats carried by flagships for the personal use of flag officers.

Barge-board, board attached to the

peacage. Much of Britain's naval reorganisation before Trafalgar was due to B.

Barham, Francis Foster (1808-71), theologian, b. near Penzance. He became an attorney and founded a mystical religion called Alism.

Barham, Richard Harris (1788-1845), humorous poet, b. Canterbury. Educ. at St Paul's and Brasenose College, Oxford, he was ordained in 1813, became a minor canon of St Paul's, 1821, and a priest in ordinary to the Chapels Royal with a city living, 1824. In 1837 he contributed to Bentley's *Miscellany* the first of his numerous tales in verse, *Ingoldsby Legends*, under the pseudonym of 'Thomas Ingoldsby.' The first collected series was pub. in 1840, second, 1842, and third, 1847, with a memoir. Their high spirits, amazing rhymes, and inexhaustible humour fully account for their lasting popularity. A plaque to B. in Burgate Street where he was b., was unveiled in

1930 by Dean Inge. See *Life and Letters* by his son, R. H. D. Barham, 1870.

'**Barham**,' The, Brit. battleship (31,000 tons), built in 1915. Flagship of 5th Battle Squadron in the battle of Jutland. She was reconitioned before the Second World War but was sunk in the Mediterranean off Sallum on 25 Nov. 1941.

Bar-Hebraeus, see ABULFARAJ.

Bari: 1. Prov. of Italy, in central Apulia (q.v.). In the N. there is a long coastal plain on the Adriatic. The S. of the prov. is a plateau. Cereals, wine, cotton, olives, and tobacco are produced. The prin. tns include Bari, Barletta, Bisceglie, Molfetta, and Altamura (q.v.). Area 2020 sq. m.; pop. 1,241,000.

2. (Anc. **Barium**), It. seaport, cap. of the prov. of Bari, and chief tn of Apulia, 230 m. E. by S. of Rome (q.v.). It is on the Adriatic. B. was an important port under the Romans. It was subsequently in the hands of the Saracens (812), the Byzantine Empire (885), and the Normans under Robert Guiscard (q.v.). In the 14th cent. it was an independent duchy, and it was annexed to the kingdom of Naples (q.v.) in 1558. During the Second World War the transmitting station at B. was bombed by the R.A.F. in 1940; there were further R.A.F. raids in 1941 and 1943, and a Ger. raid in late 1943, when the tn was being used as an allied base. There is a 12th-15th-cent. Romanesque archiepiscopal cathedral, sev. other fine medieval churches, and a 13th-cent. castle. The univ. was founded in 1924. B. is a commercial and industrial tn, with chemical, metallurgical, textile, and foodstuff manufs. Pop. 273,100.

Bariatinski, **Alexander Ivanovich**, Prince (1814-79), Russian general, served with distinction in the Caucasus, 1835 and 1845, and after successful campaigns, 1848-56, was made commander-in-chief and governor-general. Within 3 years he broke the back of Shamyl's resistance, taking his stronghold and finally the leader himself at Gunib, Darghestan, 1859. He was made field marshal, 1859, but, broken in health, retired, and d. in Geneva.

Barili, tn, W. coast of Cebu prov., Philippine Is. It is a fertile, wooded dist. growing coco-nuts and corn. It has also important fisheries. Pop. 27,267.

Barilla, Sp. name of an impure carbonate of soda imported into Britain from Spain, the Canary Is., Sicily, Italy, and France. It is obtained from the ashes of plants, especially *Salsola soda*, and is used in the manuf. of glass and soap.

Barinas, state of Venezuela E. of the Cordillera Merida. Cap. Barinas. Area 13,587 sq. m.; pop. 80,000.

Baring, name of a family of Eng. bankers and financiers, sev. members of which were distinguished as statesmen and administrators. There are 4 peerages in the family, the earldom of Cromer, and the baronies of Ashburton, Northbrook, and Revelstoke. John B. came from Bremen, in Germany, and started a cloth factory near Exeter. His son Francis (1740-1810) founded the banking house of B. Bros. in 1770, was director and

chairman (1792) of the E. India Co., supported Pitt in Parliament (1784-1806), and was made a baronet, 1793. At his death the firm was the first banking house in Europe. His eldest son, Sir Thomas (1772-1848), was a great art collector, and the firm was managed by his second son, Alexander (1774-1848), who extended its influence in America, was president of the Board of Trade, 1834, and made Baron Ashburton, 1835. He settled the Canada-Maine boundary question, 1842. At his death the management of the firm passed to Thomas (1799-1873), second son of Sir Thomas, and on his death to Edward (1828-97), son of Henry, third son of the founder of the firm, who was created Baron Revelstoke, 1885. It was during this period that the continued default of the Argentine Gov. involved the firm in such difficulties that a financial crisis ensued (1890), only relieved by the action of the Bank of England and the prin. London joint-stock banks, in taking over the enormous liabilities of the firm. B. Brothers was reorganised as a limited company. Sir Thomas B.'s eldest son, Sir Francis (1796-1866), was Chancellor of the Exchequer (1839-44), First Lord of the Admiralty (1849-52), and created Baron Northbrook, 1866; his son Thomas (1826-1904) was Viceroy of India (1872-1879) and First Lord of the Admiralty (1880-5). The youngest son of Henry B., a brother of the 1st Lord Revelstoke, was Evelyn (1841-1917), 1st Earl Cromer (q.v.).

Baring, Alexander and William, see ASHBURTON, ALEXANDER BARING, 1st BARON, and WILLIAM BARING, 2nd BARON.

Baring, Evelyn, see CROMER, EARL.
Baring, Maurice (1874-1945), novelist and poet, son of Lord Revelstoke, b. London. He was educ. at Eton and Trinity College, Cambridge, and in 1899 entered the diplomatic service. He held posts successively at Paris, Copenhagen, and Rome, but in 1904 decided to abandon diplomacy for a literary career. When the Russo-Jap. war broke out, however, he became war correspondent of the *Morning Post* in Manchuria; and was afterwards a special correspondent in Russia, Constantinople, and the Balkans. These experiences are described in *Letters from the Near East*, 1909, *The Puppet Show of Memory*, 1922, and in the novels *Tinker's Leave*, 1927, and *Friday's Business*, 1933. During the First World War he served in the Royal Flying Corps, becoming wing-commander, and was made chevalier of the Legion of Honour. He had already written some poetical plays, including *Gaston de Foix*, 1903, *Desiderio*, 1906, and *Diminutive Dramas*, 1911. Later came short stories, *Orpheus in Mayfair*, 1909, fairy tales, essays, and skits in profusion. His first novel, *Passing By*, appeared in 1921. The best of his subsequent novels are *Cal's Cradle*, 1925, *Daphne Adeane*, 1926, *The Coat without Seam*, 1929, *Robert Peckham*, 1930, and *The Lonely Lady of Dulwich*, 1934. During his journalistic career he became a Rom. Catholic. His knowledge

of foreign traditions, customs, and literature may be gathered from *A Year*

Russia, 1907, and *The Mainsprings of Russia*, 1914, as well as from his essays. His *Collected Poems* were pub. in 1925. He has been described as one of the most subtle and original writers of his time. See Dame E. Smyth, *Maurice Baring*, 1938, and L. Lovat, *Maurice Baring: a Postscript*, 1947.

Baring-Gould, Sabine (1834-1924), author, b. Exeter. Educ. at Clare College, Cambridge, he became rector of E. Mersea, Essex, 1871, and of Lew Trenchard, Devon, 1881. From 1854 onwards he wrote books on folklore, mythology, and customs, and of travel, such as the *Book of Were-Wolves*, 1865, *Curious Myths of the Middle Ages*, 1866, *Strange Survivals*, 1892, *Family Names and their Story*, 1910, and *Ciff Castles and Cave Duellings of Europe*, 1911. His theological works include *The Lives of the Saints* (17 vols.), 1872-89. From 1871 to 1873 he ed. the *Sacristy*, a quarterly devoted to the art and literature of the Church. His life of R. S. Hawker (q.v.), *The Vicar of Morwenstow*, 1875, was much criticised. His *Songs and Ballads of the West*, 1889-91, contains a valuable collection of folksongs. Of his novels the best known are *Mehalah*, 1880, *John Herring*, 1883, *Court Royal*, 1886, and *Nebo the Nailer*, 1902. He was also the author of the well-known hymns 'Onward, Christian Soldiers,' 'Now the day is over,' and others. His *Early Reminiscences* appeared in 1923. See S. M. Ellis, *Mainly Victorian*, 1925.

Baringo, Lake, in Kenya, about 40 m. N. of the equator. Its elevation is 3325 ft and its length about 16 m.

Baris, genus of coleopterous insects, belongs to the family Curculionidae, or weevils. It feeds on dead parts of trees, and is consequently not injurious in any way. *B. lignarius* feeds upon the elm-tree both in the larval state and that of the perfect insect. The little weevil selects a hollow tree, enters the dead wood under part first, lays its eggs, then dies, and its body thus blocks up the entrance and protects the young.

Barito, riv. of Indonesian Borneo, which flows southwards into the Java Sea, after a course of 550 m. It is navigable for some distance up; at high tide the bar at the mouth has over 12 ft of water.

Baritone, i.e. deep-sounding (Gk *barys*, heavy; *tonos*, tone), name of that range of the adult male voice which lies between a tenor and a bass. It is to be regarded as a high bass rather than a low tenor; compass about from the lower A on bass stave to F above the stave.

Barium, see BARI.

Barium, metallic element belonging to the group of alkaline earths. Symbol Ba; atomic number 56; atomic weight 137.36. In 1602 Casciorolus, a Bolognese shoemaker, investigated the properties of heavy spar, and noticed that it became phosphorescent in contact with ignited combustible matter. In 1774 Scheele discovered, in a sample of black oxide of

manganese, a new earth, which was afterwards identified with a constituent of heavy spar. This earth was called baryta (Gk *barys*, heavy) and was shown to be an oxide of a metal by Davy. He succeeded in producing an amalgam of the metallic B. with mercury, but no satisfactory isolation of the metal was accomplished until Guntz, in 1901, obtained an amalgam by electrolysis a saturated solution of B. chloride; the amalgam was heated in the electric arc to about 1000° C., and the B. obtained in the form of a soft, silver-white metal. B. is best produced by heating B. oxide with aluminium to 1400° C. under a high vacuum. The monoxide BaO is obtained by heating the carbonate or nitrate; further heating transforms the monoxide into the peroxide BaO₂. At a still higher temp. the additional oxygen is set free, so that by alternately lowering and raising the temp. oxygen may be absorbed and collected from the atmosphere. This action was the basis of Brin's oxygen process, now obsolete but very successful for a number of years. B. hydroxide is a white soluble powder: the solution is known as baryta water and readily absorbs carbon dioxide from the air. B. chloride is obtained by the action of hydrochloric acid on witherite (i.e. native B. carbonate, BaCO₃); it is used in the preparation of the artificial sulphate, which is used as a pigment under the name *blanc fixe*, or permanent white, the impurities in the air having no effect upon it. A mixture of B. sulphate and zinc sulphide forms the very important white pigment known as Whopone. B. nitrate is a powerful oxidising agent, and like the chlorate is used for the production of 'green fire' in pyrotechny. B. may be detected by the apple-green colour imparted to the Bunsen flame by the metal and its salts, and by the immediate precipitation of the salts by a solution of calcium sulphate. B. salts are very poisonous, causing death by paralysing the heart. In small doses they strengthen the muscular power of the heart, but are seldom employed.

Barium Sulphate, see BARYTES.

Bar-Jesus, see ELYMAS.

Barjols, Fr. tn in the dept of Var, with tanneries and shoe manufs. Pop. 2400.

Bark (ship), see BARQUE.

Bark, outside covering of the trunks and branches of trees, consisting of dried-up tissues, which often belong to different tissue systems, lying outside the active cork-cambium of stems. The first phellogen (cork-producing tissue) nearly always dies, and a second phellogen produces a cork layer cutting off the supply of water to the outside layers, and consequently aids in the formation of the B. It may be either scaly or ringed; in the first case only isolated patches of tissue have become B. and as the trunk of the tree increases in size the B. becomes torn in scales; in the second case concentric rings are formed and the B. forms a complete ring. Examples of the former are the pine, plane, and larch, of the latter, vine, clematis, birch, and honey-suckle.

The uses of B. are many and various. In savage lands, canoes, shields, baskets, and clothing are made of it. In tanning it is a most valuable object, and the *Quercus suber*, an oak of S. Europe and N. Africa, produces an outer covering which is rich in tannic acid. Sev. other varieties of oak, such as *Q. robur* and *Q. velutina*, are also much used, while *Acacia decurrens* and *Tauga canadensis*, or hemlock spruce, are other plants containing tannin. The bast fibres are employed in commerce, examples of which are flax, jute, and hemp. Medicinally B. is frequently noteworthy, the best known being cinchona; other kinds are angostura, cascara, cascarilla, and witch hazel. Cinnamon is obtained from B., the wild cherry is valued in cough mixtures, pomegranate B., or granatum, is used to expel tape-worms. Resins, gums, and balsams may be produced from various B.s.

Bark, Peruvian, see CINCHONA.

Bark-bed, bed of tanner's bark, 2 to 4 ft thick, in a brick pit of a hot-house, fermenting slowly and giving a steady heat for the rearing of tender plants. Now superseded by methods of hot water or electrical heating.

Bark-beetles, coleopterous insects of the family Bostrichidae, but the name is often given loosely to beetles of other families. They do much damage as they live on the bark of forest trees.

Barkal, or **Jebel Barkal**, flat-topped, isolated rock, rising precipitously from the desert on the r. b. of the Nile, some distance above the vil. now called Merowe. From its shape it was anciently considered to be the throne of Amen. In the New Kingdom Egyptian temples were built at B., and priests of Amen from Thebes founded Napata, eventually to be the cap. of the 25th dynasty (see EGYPT, History). There remain sev. ruined temples and many pyramids of this dynasty and its successors in the vicinity.

Barker, Benjamin (1776-1838), Eng. landscape painter, brother of Thomas B. (q.v.). He exhibited at the Royal Academy between 1800 and 1821. He pub. a set of 48 views engraved by Theodore Fielding.

Barker, Edmund Henry (1788-1839), scholar, b. Yorks; educ. at Trinity College, Cambridge. His chief work was the revision of Stephanus's *Thesaurus Graecae Linguae*, 1816-28, severely criticised by Blomfield. He d. in poverty.

Barker, Sir Ernest (1874-), historian and classical scholar, educ. at Manchester Grammar School and Balliol College, Oxford. In 1898 he was elected fellow of Merton College; in 1909 fellow and lecturer of St John's College; in 1913 fellow and lecturer of New College. In 1920 he went as principal to King's College, London. He remained at London Univ. until 1928, when he became prof. of political science at Cambridge (until 1939), also being elected fellow of Peterhouse. From 1947 to 1948 he was prof. of political science at Cologne Univ. His works include *The Political Thought of Plato and Aristotle*, 1906, *Political Thought in England from Herbert Spencer to To-day*, 1915, *Greek*

Political Theory, 1918, *The Crusades*, 1923, *Ideas and Ideals of the British Empire*, 1941, *The Character of England* (ed.), 1947, and *Principles of Social and Political Theory*, 1951. His *Age and Youth*, 1953, is autobiographical.

Barker, Harley Granville-, see GRANVILLE-BARKER.

Barker, Sir Herbert Atkinson (1869-1950), manipulative surgeon, b. Southport. Educ. for the law, he early displayed such ability for manipulative surgery that he was placed under the tuition of Mr J. Atkinson, to whose practice he succeeded in 1904. Though he successfully treated over 40,000 cases of flat-foot, joint abnormalities, etc., he never received the formal recognition of the medical profession. He was knighted in 1922 for his services in the First World War. In 1936 he gave a demonstration of his methods before an audience of the Brit. Orthopaedic Association, and made a film for record purposes. He was elected manipulative surgeon to Noble's Hospital, Isle of Man, in 1941. His memoirs, *Leaves from my Life*, were published in 1927.

Barker, Robert (1730-1806), Irish artist, b. Ireland; settled in Edinburgh as a portrait painter. In 1788 he produced the first panorama, that of Edinburgh, following a suggestion of a Ger. architectural decorator, Breislitz. He subsequently produced popular panoramas of London, and of naval battles of the time.

Barker, Thomas (1769-1847), Eng. landscape painter, b. near Pontypool, Monmouthshire. He was allowed facilities for copying the works of some Dutch and Flem. masters by a rich coach-builder of Bath named Spackman, who sent him to Rome for 4 years in 1790. He returned to England after this and settled at Bath. Few pictures of the Eng. school have been more widely known than 'The Woodman,' which was engraved by Bartolozzi. His landscapes and rustic scenes were popular, being engraved on china, linen, and pottery, though they were often imitative of the work of other artists, including Gainsborough (q.v.).

Barker, Thomas Jones (1815-82), painter, son of the above, b. Bath. After being given some education in art by his father, he went to Paris in 1834, and was a pupil of Horace Vernet for sev. years. He exhibited frequently at the Salon, his first picture there, 'Beauties of the Court of Charles II,' gaining him a gold medal. In 1840 he was awarded the cross of the Legion of Honour for painting 'The Bride of Death' for the youngest daughter of Louis-Philippe. In 1845 he returned to England, and painted the portraits of sev. eminent men, Disraeli amongst them. He went to the Franco-Ger. war, whence he obtained many subjects for pictures.

Barking, parl. and municipal bor. of Essex, England, situated on the R. Roding, 8 m. from London. A Benedictine double monastery founded here c. 670 by St Erkenwald, Bishop of London, became one of the richest in England. Destroyed by the Danes in 870, it was restored by King Edgar a cent. later, and

dissolved in 1539. The church of All Hallows B. (q.v.) belonged to it. The church of St Margaret, B. has some interesting monuments. Before modern development B. supplied London with vegetable produce. The chief industries are jute, rubber, and chemical manuf. One of the largest electricity generating stations in the U.K. is situated here. B. is a suffragan bishopric to St Albans; it returns one member to Parliament. Pop. 78,170.

Barking Deer, see MUNTJAC.

Barkla, Charles Glover (1877-1944), physicist, b. Widnes, Lancs, studied at Liverpool and Cambridge. Prof. at King's College, London (1909-14), and at Edinburgh (1914). Elected fellow of the Royal Society 1912, and awarded the Nobel prize in 1917 for his discovery of the characteristic X-rays emitted by the elements. He first showed that X-rays could be polarised by scattering and were therefore transverse waves.

Barkly, Sir Henry (1815-98), Scottish colonial administrator. In 1848 he became governor of Brit. Guiana, where he advocated the introduction of coolies and Chinese as labourers, and developed the colony by building railways. 1853-6, Governor of Jamaica; 1856, of Victoria; 1863, of Mauritius; 1870-6, of the Cape. He was knighted in 1853.

Barkly West, tn in the N. div. of Griqualand W., Cape Province, 25 m. as the crow flies from Kimberley. It is the cap. of the dist. of the same name, and possesses diamond mines, in which the 'river stones,' of great value, are found. It is situated at an elevation of 3630 ft. Pop. (Whites) 692.

Bar-kokba, see BAR-COCHBA.

Barkol, tn of Dzungaria, in Sinkiang, China, to the N. of the Gobi desert. Near to it is Lake Barkol, which is situated 5100 ft above sea level.

Barkway, anct. vill. of Herts, England, about 4 m. SSE. from Royston. At the time of the Conquest the lands were divided among 4 great lords into as many manors, and afterwards into 8 manors. It was privileged by Edward I to have a market on Thursday, but this has been discontinued. Pop. 600.

'Barlaam and Josaphat', Christian religious romance popular in the Middle Ages. The Gk version is attributed to St John Damascene (675-749), but modern writers have traced an original Sanskrit source from which the Christian version is derived through Manichean channels. The story has affinities with the life of Buddha, and the name Josaphat is a perversion of Bodhisat (see Bodhisattva myth under LAMAIISM). B. and J. also embodies an abbreviated version of the *Apology* of Aristides and the story of the 3 caskets, used by Shakespeare in the plot of *The Merchant of Venice*. Both B. and J. were canonised by the E. and Rom. Churches. There is a text and trans. of the romance by G. R. Woodward and H. Mattingly. 1914.

Barlaeus, Casparus, or Caspar van Baerle (1584-1648), Dutch poet and historian, b. Antwerp. He studied theology at

Leyden, where he became prof. of logic in 1617. He wrote poems, chiefly in Latin, and a hist. of Brazil, which was then possessed partly by the Dutch.

Bar-le-Duc, Fr. tn, cap. of the dept of Meuse, on the Orain, and on the Marne-Rhine canal. Once cap. of the duchy of Bar, it has many fine old churches and mansions, and the remains of the ducal palace. The church of St-Étienne contains a curious sculpture of a skeleton. The Old Pretender (see STUART, JAMES EDWARD) lived here for some years, and the tn was the bp. of the 2nd Duke of Guise, Oudinot, Exelmans, and Raymond Poincaré (qq.v.). There are hosiery, metallurgical, and foodstuff manufs., and breweries. Pop. 15,500.

Barleria, genus of Acanthaceae found in the E. Indies. A few species grow in Eng. gardens and hothouses, and of these *B. lupulina*, with its large bracts resembling hops, and *B. prionitis*, a common swamp plant in Java, are the most remarkable.

Barletta, It. seaport, in Apulia (q.v.), on the Adriatic, 32 m. NW. of Bari (q.v.). It has a castle, and an archiepiscopal (B. and Trani, q.v.) cathedral, before which stands an antique bronze statue of the Emperor Honorius (q.v.). The tn is an important agric. centre, with a large trade in wine, and chemical and soap manufs. The *Disfida di Barletta* by Massimo d'Azeglio celebrates an incident during a siege of the tn by the French in 1503: a contest between 13 chosen knights of Italy and 13 of France. The Italians were victorious. Pop. 65,500.

Barley (*Hordeum*), cereal of anct. culture, which belongs to the family Gramineae. There are 4 unimportant species of B.-grass in the Brit. Isles. *H. vulgare* is the cultivated species, growing as far N. as 70°; it is the Scottish bere or bigg, and has its grains in 4 rows; *H. distichum* is a 2-rowed and *H. hexastichum* a 6-rowed variety. *H. coeleste*, the Siberian B., a variety with naked seeds, is cultivated in some parts of Europe, but the grain shakes off so easily as to render bad harvests frequent.

Formerly B. was considered to be of great value as a food in England, but now it is most often converted into malt for brewing and distilling. Ground down into B.-meal, it is used for bread-making in N. Europe, and is a food for pigs; it is also made into decoctions for invalids, especially those who have pulmonary complaints, and is extremely soothing in fevers. The varieties known as pot-B. and pearl-B. are very nutritious and wholesome, and may be used in broths, stews, puddings, and as a substitute for rice. The former kind is obtained by depriving the grain of its outer husk, the latter by rounding it and polishing it in the mill after the removal of the husk. In Scotland a peculiar dish, called sowens, is made of the bran, which is steeped in water and allowed to ferment for sev. days until it becomes acid. B. is a shallow-rooted crop and is best suited to light loams. The best quality B. is grown where these soils are associated with

moderate temps. and a moderate, well-distributed rainfall.

The development of this crop in the Commonwealth has shown an increasing trend since 1937, particularly in Canada and the U.K. The acreage under B. in 1953-4 in Commonwealth countries was 22,050,000, compared with an average of 13,580,000 in 1937-40. In fact, the acreages in Canada, the U.K., and Australia were doubled during this period. In 1953-4 they were: Canada, 8,911,000; India, 8,010,000; U.K., 2,226,000; and Australia, 1,803,000 ac. The area under B. in foreign countries (excluding China and the U.S.S.R.) for the same year was 82,200,000 ac. The Commonwealth produced 12,500,000 tons of B. in 1953-4 and foreign countries 33,100,000 tons. Production in the U.K. was 2,521,000 tons but 1,436,000 tons were also imported. The main sources of these imports were Canada (580,000 tons), Argentina (116,000 tons), and Australia (106,000 tons). Thus world production of B. is at a high level and much of it is centred in Commonwealth countries. The greater demand for B. since the war reflects not only its increased use as food in Europe but the large imports into Japan and Korea to supplement supplies of rice.

Barley-break, old Eng. country game which was popular in the 16th and 17th cents., referred to by Herrick, Sidney, Suckling, and Massinger, and still surviving with modifications in the N. of England and Scotland. It was played by 6 couples, 3 of each sex, placed in 3 adjoining plots of ground, the central one being called 'hell.' The middle couple, always united, had to attempt to catch the other couples as they changed places, these latter being allowed to 'break.' The name may have come from the stuck-yard in which it was played.

Barley Midge, dipterous insect of the family Cecidomyiidae, allied to the Hessian fly, or *Cecidomyia destructor*. It obtains its name from its destruction of barley, while the latter is a spoiler of wheat.

Barley-sugar, confection made with syrup prepared from sugar, hardened in moulds and generally twisted into spiral sticks. Originally the sugar was boiled in a decoction of barley.

Barleycorn, John, malt liquor personified and a familiar figure in old Eng. ballads and pamphlets. The song of J. B., from *The English Dancing Master*, 1651, is generally attributed to Robert Burns, but all that Burns did was to alter slightly various parts of it. Also a corn measure—the third part of an inch in length. The term barleycorn is used in old conveyances of land as a synonym for a nominal consideration.

Barlow, Jane (1857-1917), authoress, b. Clontarf, Dublin, where her father, the Rev. W. B., was vice-provost of Trinity College. Of her numerous sketches, novels, and tales of Irish life and character may be mentioned *Irish Idylls*, 1892, *Strangers at Lisconnel*, 1895, *Creel of Irish Stories*, 1897, *Irish Neighbours*, 1907, *Irish Ways*, 1908, *Mac's Adventures*, 1911,

Flaws, 1911, and *Doings and Dealings* 1913.

Barlow, Joel (1754-1812), Amer. politician and writer, b. Reading, Connecticut. He pub. his bombastic poem *The Vision of Columbus*, 1787, expanded into *The Columbiad*, 1807. He went to France, 1788, and became a violent republican. His best work is *Hasty Pudding*, a mock epic, 1793. He was Amer. consul at Algiers, 1795-7, and ambas. to France, 1811. He d. near Cracow on his way to visit Napoleon. See life by C. B. Todd, 1866, and M. C. Tylor, *Three Men of Letters*, 1895.

Barlow, Peter (1776-1862), mathematician, b. Norwich. From 1806 to 1848 he was prof. of mathematics at the Royal Military Academy, Woolwich. His pub. on pure mathematics include *Elementary Investigation of the Theory of Numbers*, 1811, and his *New Mathematical and Philosophical Dictionary* appeared in 1814. His studies in magnetic attraction, on which he pub. a treatise (1820), led to improvements in the compass, and the pattern he introduced remained in use till superseded by the Thomson compass in 1876.

Barlow, Thomas (1607-91), Eng. prelate, was fellow and tutor at Oxford, where he was noted as a keen controversialist and casuist. He was provost of Queen's College and Bodley's librarian, 1642 and 1660. He was made archdeacon of Oxford, 1661, and Bishop of Lincoln, 1675. He was the writer of innumerable pamphlets and books, and a violent opponent of Rom. Catholicism. Through all the political changes of his long life he managed to retain all his clerical benefices and preferments. His works include *Gunpowder Treason Popery, Ecclesiastical and Metaphysicæ de Deo*, and *Concerning the Invocation of Saints*.

Barlow, Sir Thomas (1845-1945), physician, graduated in medicine in 1873 at London Univ., after being educ. at Owen's College, Manchester, and graduating in arts at London in 1867. Became fellow of the Royal College of Physicians in 1880; president, 1910-15. Became Holme Prof. of Clinical Medicine at Univ. College; fellow of the Royal Society; and president of the International Medical Congress (1913). He was physician to the households of Queen Victoria and King Edward VII, 1901-10, and physician extraordinary to King George V. He was also physician at the London Fever Hospital, and consulting physician to Univ. College Hospital, and Hospital for Sick Children, Great Ormond Street, London. His outstanding contribution to medical science was that which he made on infantile scurvy and its relation to rickets. This made his name known throughout the world—the condition, previously and improperly called scurvy-rickets, now being known as B.'s disease. The benefits which this contribution has conferred on children throughout the world are incalculable. He was created a baronet, 1900.

Barlow, Thomas Oldham (1824-89), line engraver and mezzotinter, made

R.A. 1881; he reproduced the works of his contemporaries, including Landseer, Turner, Millais.

Barlow, William Henry (1812-1902), engineer; he supported the use by engineers of the steel produced by the Bessemer process. The chief works on which he was engaged include the building of St Pancras station, London, the Clifton suspension bridge, and the Tay bridge.

Barmecides, or descendants of Barmak, a noble Persian family, who held positions of influence under the first 5 Abbasid caliphs and for about 50 years (752-804) directed the affairs of the caliphate: they were famous for their wise administration and patronage of learning. Khalid ibn Barmak was minister of Mansur, and his son Yahya tutor and later vizier to the great Harun al-Rashid, in whose reign the family reached their highest power and prosperity, his sons Fadl and Ja'far enjoying high favour. Their power appears to have drawn upon them the jealousy of Harun, and in 804 Fadl, Ja'far, and many members of the family were exterminated. The romantic story is that Harun discovered that Ja'far had betrayed the caliph's sister after a marriage which was to be purely formal. The mock banquet or proverbial Barmecide feast is well known from the *Arabian Nights* 'Barber's Tale.'

Barmen, see WUPPERTAL.

Barmouth, seaside resort, Merioneth, N. Wales, in Cardigan Bay, at the mouth of the Mawddach. Pop. 2500. Cader Idris lies across the Mawddach, and the vale of Llangollen and Dolgelly afford beautiful excursions.

Barn, see FARM.

Barnabas, St., native of Cyprus; by descent a Levite, his first name being Jesus, or Joseph. The name of B. (son of consolation) was given to him by the apostles as appropriate to his character and works of charity. He is first mentioned in Scripture in Acts iv. 36. He it was who first introduced St Paul to the apostles. Later he induced him to leave Tarsus and come to Antioch. B. is supposed to have been martyred in Cyprus, but many traditions take him to Milan, Rome, and Alexandria. His feast is on 11 June.

Barnabas, The Epistle of St. The extant epistle consists of 2 parts, the first in Latin, the second in Greek. In the Greek some parts are missing. The first is an exhortation, an argument to constancy in the belief and profession of the Christian doctrine. The second contains moral instructions. The N.T. is not quoted in it. Origen and Clement of Alexandria believed it to be authentic, and Lardner was also of that opinion, but it is now believed to be pseudonymous, and written by a Christian writer somewhere about the year 120.

Barnabites, religious order, founded about the year 1530 under the name of Regular Clerks of the Congregation of St Paul; they are so called because they first met in 1538 in the cloister of St Barnabas at Milan. Their prin. object was the educ. of the young. They were

forbidden to accept preferment in the Church save at the express command of the Pope. The order spread to France, Germany, Austria, and Spain. They were suppressed during the time of the Fr. Revolution, but returned in 1850. In 1880 they were expelled from France, but there are still a few monasteries in the other countries mentioned.

Barnaby, Sir Nathaniel (1829-1915), naval architect, b. Chatham of a family of shipwrights. In 1854 he became an admiralty overseer, and from 1870 to 1885 was chief naval architect in the offices of the controllers of the navy. He pub. sev. works on shipbuilding.



Barnaacle, Bernicle, marine attached crustaceans of the order Cirripedia. The common goose B. (*Lepas*) is attached by a stalk while *Balanus*, the acorn B., has no stalk. Typically there are 6 pairs of comb-like, biramous thoracic limbs which 'comb' the sea for food.

Barnaacle Goose (*Branta leucopsis*), Arctic bird which visits Britain in winter. It receives its name from an anct fable that it was an offspring of the barnacle (q.v.). It is about 2 ft in length, weighs about 5 lb., is black and white in colour, marbled with blue and grey, the beak is black, streaked with red. It was bred in Britain by the Earl of Derby in 1834, and its flesh is used for food.

Barnard, Lady Anne (1750-1825), poetess, daughter of James Lindsay, 5th Earl of Balcarres, married in 1793 Andrew B. and went with him to Cape Town, where he was Colonial Secretary. On his death in 1807 she returned and settled in London. Her famous ballad of 'Auld Robin Gray' was written in 1771 and pub. anonymously; in 1823 she confessed the authorship to Sir Walter Scott. *South Africa a Century Ago*, 1901, is a collection of her letters from the Cape. See D. Fairbridge, *Lady Anne Barnard at the Cape of Good Hope*, 1924, and M. Masson, *Lady Anne Barnard*, 1948.

Barnard, Edward Emerson (1857-1923), Amer. astronomer, b. Nashville, Tennessee, in poor circumstances. He was apprenticed at the age of eight to a photographer, and when a mere child was fond of observing the heavenly bodies with a toy telescope. He discovered his first comet in 1881, and two years later secured a fellowship in the Vanderbilt Univ. and a post in the observatory. In 1887 he went to the Lick Observatory, and in June 1892 he discovered the fifth satellite of Jupiter. In 1897 he was transferred to Yerkes Observatory where he made many important discoveries, amongst which were the 'dark' nebulae, and he catalogued 182 of these. He discovered the swift-moving star in Ophiuchus known as 'Barnard's Star' which is a near neighbour of the sun, being only 6 light years distant, proper motion 10.30"—the greatest proper motion of any star—and magnitude 9.7. He also discovered a number of comets.

Barnard, Frederick (1846-96), artist, studied at Heatherley's Art School and in Paris. His first work was a set of charcoal drawings, 'The People of Paris.' He contributed to *Punch*, 1863-5, and was cartoonist to *Fun* for 2 years. His best-known work is his illustration of the household ed. of Dickens, 1871-9. He also illustrated Thackeray and *Pilgrim's Progress*, 1880, and was a painter in oils.

Barnard, Frederick Augustus Porter (1809-89), Amer. scientist and educator, b. at Sheffield, Massachusetts; graduated at Yale, 1828. Teacher to the deaf and dumb at Hartford, Connecticut, and later (1832-7) at the New York Institution for the Deaf and Dumb. From 1837 to 1861 he taught in or presided over sev. univs. At the outbreak of the Civil war he retired to Washington. He was president of Columbia College, 1864-89.

Barnard, George Grey (1863-1938), Amer. sculptor, b. Bellefonte, Pennsylvania, educ. at the Art Institute of Chicago and the École Nationale des Beaux Arts. He exhibited in the Salon, 1894, and, in 1900, was awarded the gold medal at the Paris exposition. He was prof. of sculpture at the Art Students' League, New York, 1900-4. His works include 'A Monument to Democracy,' 1920, which comprises 400 figures in plaster; and the 'Great God Pan' (Central Park). His bronze statue of Lincoln, unveiled at Cincinnati, 1917, raised much controversy.

Barnard, Henry (1811-1900), Amer. reformer of education, b. Hartford, Connecticut, educ. Yale; was a member of the Connecticut legislature and reorganised the state schools, 1837-42. In various offices he reformed education in Rhode Is., Wisconsin, and Maryland, and was first U.S. commissioner of education, 1867-70. His publs. are numerous and he was founder and editor of the *American Journal of Education*, 1855-81.

Barnard Castle, tn. of co. Durham, England, on R. Tees, 15 m. N.W. of Darlington. It contains the ruins of a 13th-cent. castle built by Barnard Balliol, grandfather of John Balliol, King of Scotland. B. C.

School was founded in 1883. The fine Bowes Museum is in Fr. Renaissance style. The chief manuf. is penicillin. Pop. 5000.

Barnard College, for women, New York City, U.S.A., was founded in 1889 and named after President Frederick A. P. Barnard (q.v.) of Columbia College, in honour of his persistent but vain efforts to obtain the Columbia trustees' approval of the admission of women on equal terms with men. B. C. has been affiliated to Columbia Univ. since 1900, and the president of that univ., *ex officio*, is president and a trustee of B. C. The students register in the univ. In 1955 the teaching staff numbered 160; the students 1200.

Barnardiston, Nathaniel Walter, Major-General (1858-1919), Brit. soldier. He was military attaché at Brussels in 1906, and in that year visited Gen. Ducarne, chief of the Belgian General Staff, to discuss the military measures that Great Britain would adopt in the event of a violation of Belgian neutrality by Germany.

Barnardo, Thomas John (1845-1905), Eng. philanthropist, b. in Ireland, and came to study medicine at the London Hospital, where he became interested in the condition of destitute children. In 1867 he opened his first 'home of refuge' in Commercial Road, and in 1873 he founded a 'vil. home' of 52 cottages at Ilford, Essex, for training girls in home conditions (see next article). See J. W. Bready, *Dr Barnardo: Physician, Pioneer, and Prophet*, 1930, and A. E. Williams, *Barnardo of Stepney*, 1948.

Barnardo's (Dr) Homes: National Incorporated Association, founded in 1866, with head offices in Stepney Causeway, E.1., having the charter 'No destitute child ever refused admission' and the motto 'For God and Country.' The objects of the homes are to rescue, train, and place out in suitable situations in life destitute, orphan, and forlorn children, irrespective of their age, sex, or creed; physical disability has been no bar to their admission, except in the case of the mentally defective and epileptic. Since its foundation over 150,000 children had passed through its hands up to 1957. The average number in residence is about 7000. The B. H. now have over 110 branches, consisting of separate cottages and households, as well as branches in Australia for immigrants.

Barnato, Barnett Isaacs (1852-97), Eng. financier, son of humble Jewish parents of Aldgate, educ. under Moses Angel at Jews' Free School, Spitalfields. In 1873 he went to S. Africa as conjurer and entertainer; later assumed the name of B., and traded as diamond dealer at Kimberley. In 1880 he estab. the London firm of B. Brothers; in 1881 floated the B. Diamond Mining Co., Kimberley. In 1888 amalgamated with De Beers Co., controlled by Cecil Rhodes. B. was a member of Kimberley divisional council from 1880; member for Kimberley in Cape Assembly, 1888 and 1894. He invested in mining and other property

in the Rand (Transvaal), and was chief manipulator of the 'Kaffir boom,' London, 1895, suffering heavy losses afterwards. B. committed suicide by jumping from a vessel during a voyage from Cape Town. See H. Raymond, *B. I. Barnato: a Memoir*, 1897.

Barnaul, city on the Ob' in S. Siberia, cap. of the Altay Kray (q.v.), and its economic and cultural centre. It has large textile (cotton from Central Asia), engineering, and food industries. The oldest local museum in Siberia is here. Pop. (1956) 255,000 (1861, 12,000; 1926, 74,000; 1939, 148,000). Founded in 1738 as a silver-smelting plant, B. became a town in 1771 and for a cent. was administrative centre of the Altay mining industry; later it became the chief trading centre of the biggest agric. region in Siberia. The construction of the Turksib Railway (q.v.) and the Second World War gave new impetus to its industrial development.

Barnave, Antoine Pierre Joseph Marie (1761-93), Fr. revolutionary, b. Grenoble; he became a lawyer. In 1789 he represented Grenoble in the States-General, where for some time he had much influence as a leader of the popular party. In 1791 he was one of the commissioners who brought Louis XVI back from Varennes to Paris, and his sympathy seems to have been aroused, as after this he advocated more moderate and constitutional measures. In 1792 he was impeached on a charge of royalist sentiments, and guillotined in 1793.

Barnburners, political faction in Amer. hist., so called about 1844 on account of their enthusiastic support of radical reforms, which was compared with the rigour of the Dutchman who burnt down his barn to destroy the rats. They grew dissatisfied with the scanty recognition they received in the Democratic national convention of 1847, and joined the Free Soilers in supporting the presidential candidature of Van Buren. Many of them eventually affiliated with the Republican party.

Barnes, Albert (1798-1870), Amer. theologian, b. Rome in the state of New York. He was educ. at Princeton Theological Seminary. After being in charge of a church in New Jersey, he became the minister of the First Presbyterian Church at Philadelphia in 1830. He was tried for heresy, on account of the tone of some of his *Notes . . . on the Epistle to the Romans*, but was acquitted. He was a gifted preacher, and latterly belonged to the new school of Presbyterians. He resigned, on account of failing eyesight, from Philadelphia in 1867, and d. in that city on 24 Dec. 1870. He is best known for his notes to various books of the O.T. and N.T. which are admirably adapted for Sunday schools and Bible classes.

Barnes, Barnabe (c. 1569-1609), poet and dramatist, b. in Yorks, son of a bishop of Durham. Educ. at Brasenose College, Oxford, he went to France with the Earl of Essex in 1591. His works include *Parthenophile and Parthenophe*,

1593, a collection of sonnets, elegies, odes, and madrigals; *A Divine Century of Spiritual Sonnets*, 1595; and a tragedy, *The Devil's Charter*, printed in 1607 and performed before James I. A friend of Gabriel Harvey, B. had at his best a true poetic vein. He contributed to the revival of the sonnet, and from his style has been regarded as a precursor of the 'metaphysical' poets of the 17th cent.

Barnes, Ernest William (1874-1953), Bishop of Birmingham and F.R.S., educ. at King Edward School, Birmingham. At Trinity College, Cambridge, he had a distinguished mathematical career, being bracketed second wrangler, 1896. Ordained, 1902; master of the Temple, 1915-19; Canon of Westminster, 1918-1924; Bishop of Birmingham, 1924. His reaffirmation of the Darwinian evolutionary belief, and his prohibition in his diocese of the practice of reservation of the sacrament, brought him into conflict with Anglo-Catholics. On 16 Oct. 1927, when he was about to preach in St Paul's, a London clergyman present called for his excommunication; and in 1930 he refused to defend himself in a civil court action by a recalcitrant presentee whom he had declined to admit. Pubs.: *Papers on Gamma Functions, Integral Functions, Linear Difference Equations*, contributions to the transactions of the Royal Society, the Cambridge Philosophical Society, and the London Mathematical Society; and various sermons: *Should Such a Faith Offend?*, 1927; *Scientific Theory and Religion* (Gifford Lectures), 1933; *The Rise of Christianity*, 1947.

Barnes, George Nicol (1859-1940), politician, b. Lochie, Scotland. His political life was spent in Labour and trade union politics. B. was general secretary of the Amalgamated Society of Engineers and chairman of the Parliamentary Labour party, which he represented in Lloyd George's War Cabinet. He entered Parliament in 1906 and sat for a Glasgow div. until 1922. Cabinet minister, 1917-20, and member of Peace Conference, 1919. His greatest service was the draft proposals he prepared for the Commission on World Labour, which subsequently developed into the International Labour Office.

Barnes, Harry Elmer (1889-), Amer. educationist, educ. at Syracuse and Columbia Univs., and engaged in research at Harvard. He has taught at Clark Univ., Amherst College, Columbia Univ., and was prof. of the hist. of sociology, Smith College, 1923-30. He was historian to the Pennsylvania Penal Commission, 1918; statistician to the War Dept. 1918. From 1929 to 1940 he was on the editorial staff of the Scripps-Howard newspapers. Pubs.: *Sociology before Comte*, 1917; *History—its Rise and Development*, 1919; *The New History and the Social Studies*, 1925; *Evolution of Penology in Pennsylvania*, 1927; with H. David, *A History of Western Civilization* (2 vols.), 1935; *An Economic History of the Western World*, 1937; with H. Becker, *Social Thought from Lore to Science* (2 vols.), 1938.

Barnes, Joshua (1654-1712), scholar, *b.* London. He was educ. at Christ's Hospital, and afterwards went to Emmanuel College, Cambridge. He was appointed regius prof. of Greek at Cambridge in 1695. B. is best known for his ed. of Homer, 1711, 2 vols. 4to, and of Euripides, 1694, folio. For his 'injurious publs.' and his quarrel with Bentley, see *Jebb's Bentley* in *Eng. Men of Letters*, 1881, pp. 35-6.

Barnes, Juliana, see **BERNERS**.

Barnes, Robert (1495-1540), reformer and martyr, educ. at Cambridge. In 1526 he was condemned to abjure or be burnt for preaching a heterodox sermon; he was persuaded to recant, but remained for a time in prison. He was sent to Germany in 1535 to induce the Lutheran divines to approve of the annulment of Henry VIII's marriage with Catherine of Aragon. He attacked Bishop Gardiner in a sermon at St Paul's Cross, and in consequence of this was burnt.

Barnes, Thomas (1785-1841), journalist and editor of *The Times*. He was educ. at Christ's Hospital and Pembroke College, Cambridge, taking his degree in 1808. He took up the profession of journalism in London, and was a member of the literary circle which included Leigh Hunt, Hazlitt, and Charles Lamb. He took over the editorship of *The Times* when Dr Stoddart retired in 1817, and raised it to the position that caused it to be nicknamed 'the Thunderer.'

Barnes, William (1801-86), clergyman, philologist, and poet, *b.* Rushay, Dorset. In 1823 he went to teach in a school at More, Wilts; in 1835 became master of the grammar school at Dorchester; in 1847 was ordained and became curate of Whitcombe; in 1862 became rector of Winterborne Came, where he spent the rest of his life. His Dorset poems exhibit a deep love of nature and a keen knowledge of his rustic neighbours. They are steeped in Dorset lore and written in the Dorset dialect. The 3 collections appeared under the names of *Poems of Rural Life in the Dorset Dialect*, with a *Dissertation and Glossary*, 1844. *Humely Rhymes*, 1859, and *Poems of Rural Life in Common English*, 1868. The 3 were collected in one vol., pub. in 1879 with the same title as the first. His philological works include *Se Gefylsta, an Anglo-Saxon Dialect*, 1849, *A Philological Grammar*, 1854, *Trac. or a View of Roots and Items of the English as a Teutonic Tongue*, 1861, and *A Grammar and Glossary of the Dorset Dialect*, 1864. See life by his daughter, Lucy Baxter ('Leader Scott'), 1887.

Barnes, tn and bor. of Surrey, England, situated on the r. b. of the R. Thames, N. of Richmond, and including the pars. of B., Mortlake (q.v.), and E. Sheen. Open spaces include part of Richmond Park, Sheen Common, and B. Common. Pop. 40,567.

Barnet, urb. dist. and mrkt tn of Herts, England, on the N. edge of Greater London (11 m). The ann. Sept. horse fair chartered by Henry II is still held. The second battle of B.

(1471) is commemorated by an obelisk (erected 1740) at Hadley Highstone, where the Earl of Warwick is alleged to have fallen. The urb. dist. comprises 3 main localities: B., Arkley (1 m. W.), and Totteridge ($\frac{1}{2}$ m. S.). Pop. 25,017.

Barnett, Henrietta (1851-1936), social worker, wife of Canon S. A. Barnett (q.v.). She started the Children's Country Holiday movement in 1878 and, soon afterwards, the London Pupil Teachers' Association, of which she was president from 1891 to 1907. Co-operated in the formation of the Whitechapel art gallery, which was opened in 1901, and collaborated with her husband in much of his work. Created D.B.E. in 1924.

Barnett, John Francis (1837-1916), pianist and composer, nephew of the preceding, *b.* London, studied at Royal Academy of Music, London, and Leipzig Conservatorium; became prof. at the Guildhall School of Music and the Royal College of Music. In 1861 he played at a Gewandhaus concert at Leipzig, and his first noteworthy composition, a Symphony in A minor, was performed in 1864 by the Musical Society of London. His works, mainly cantatas, include *The Ancient Mariner*, 1867, *Paradise and the Peri*, 1870, and *The Lay of the Last Minstrel*, 1873.

Barnett, Samuel Augustus (1844-1913), clergyman, *b.* Bristol, becoming canon there, 1894. He was educ. at Oxford. Curate of St Mary, Brynston Square, London, 1867-72; vicar of St Jude's, Whitechapel, 1872-94. Here he taught by music and non-biblical readings those who would not attend church; he held art exhibitions and introduced E. London to good pictures, resulting in the building of Whitechapel art gallery. His par. library developed into Whitechapel public library. He had a large share in promoting the Artisans' Dwelling Act, 1875. He was a guardian in Whitechapel for 29 years from 1875 and chairman for 12 years. With his wife Henrietta (q.v.) he founded the Children's Country Holiday Fund, 1877. He was one of the founders of Toynbee Hall (q.v.), and first warden, 1884-96 (president, 1906). Canon of Westminster 1906, president of the Sunday Society. B. pub. *Practicable Socialism* (with his wife), 1888, *The Service of God*, 1897, *Religion and Progress*, 1907, *Towards Social Reform* (with his wife), 1909, and *Religion and Politics*, 1911. See H. O. Barnett, *Canon Barnett: his Life, Work, and Friends*, 1918.

Barneveld, tn in the prov. of Gelderland, Netherlands, 17 m. NW. of Arnhem. It has poultry farms and an important egg market. Pop. 22,000.

Barneveldt, Jan van Olden (1547-1619), Dutch statesman, grand pensionary of Holland. He was *b.* at Amersfoort in Utrecht. He studied law and divinity at Heidelberg and The Hague, and became an advocate, 1569. He was appointed one of the advocates of the court, and was chosen counsellor and pensionary of Rotterdam in 1576. In his capacity as advocate-general and grand pensionary, B. headed a deputation to England to

make a formal offer of the revolted provs. of the Netherlands to Queen Elizabeth. B. now became leader of the republican party, opposed the war policy of Prince Maurice, and brought about a truce with Spain in 1609, which lasted 12 years. He took the side of the Arminians against the Calvinists, who were supported by Maurice. In 1618 a national synod, known as the Synod of Dort, was summoned to settle the great struggle between the Arminians and the Gomarites. B. and his friends Grotius and Hoogerbeets were arrested and tried. B. was found guilty of treason and was beheaded in the courtyard of The Hague, May 1619. *See* J. L. Motley, *Life of Barneveldt* (2 vols.), 1874.

Barney, Joshua (1759-1818), Amer. naval officer, b. Baltimore, Maryland, U.S.A. He entered the naval service, and at the age of 17 obtained the commission of lieutenant in the Amer. Navy. When on active service on board the *Saratoga* he was placed as prize-master of a captured Brit. ship, which in an almost sinking condition was recaptured by an Eng. 74-gun ship, and B. sent to England. In 1782 he escaped from prison and returned to America, where, as commander of a small ship of war, he captured a brig belonging to the Brit. Navy off Delaware. For this he received the thanks of the legislature of Pennsylvania and was promoted to the rank of commodore. He was afterwards sent with dispatches to Dr Franklin in Paris and returned with the news of the signing of preliminary articles of peace between England and America, 1784. When war broke out in 1812 he joined in a land attack at Bladensburg, and received a wound in the leg. He was appointed naval officer at Baltimore. He d. at Pittsburgh.

Barnfield, Richard (1574-1627), poet, b. Norbury, Shropshire, spent most of his life at Stone, Staffs. He wrote sonnets and pastorals. His works include *The Affectionate Shepherd*, 1594, a pastoral based on Virgil's second eclogue; *Cynthia, with certain Sonnets and the Legend of Cassandra*, 1595; and *The Kneecomon of Lady Pecunia*, 1598, which contains 2 of his best songs: 'As it fell upon a day' and 'If music and sweet poetry agree.' These were reprinted in *The Passionate Pilgrim*, 1599, and long attributed to Shakespeare.

Barnoldswick, urb. dist. of Yorks. (W. Riding), England, 9 m. from Skipton, on the Liverpool-Leeds Canal, with cotton-weaving and engineering industries. Pop. 10,300.

Barnsley, co. bor. (since 1912) and parl. constituency of the W. Riding of Yorks, England, on the R. Dearne, 16 m. N. of Sheffield. B. was mentioned in Domesday Book; to-day it has a fine tn hall, a large mining and technical college, a grammar school and a girls' high school, a teachers' training college, libraries, and baths. Large open-air markets are held bi-weekly. The chief parks are Locke Park and Cannon Hall Park. B. is at the centre of the S. Yorks. coal-field, and the chief industries are coal-mining, glass-making, engineering, paper-making,

and metal canister manuf. One member is returned to Parliament. Pop. 75,625.

Barnsleys, The, *see* FURNITURE.

Barnstaple, seaport tn of Devon and oldest bor. in England, 6 m. from the mouth of the R. Taw and 40 m. NW. of Exeter. There is a 14th-cent. par. church, a grammar school endowed in 1649 (occupying part of a ruined monastery) at which the poet John Gay was educ., and sev. old buildings and a castle mound. The riv. is crossed by a 12th-cent. bridge of 16 arches. The tidal harbour and B.'s situation as a centre of N. Devon for agriculture, commerce, administration, and as a tourist centre give the tn importance. Lace, gloves, furniture, light engineering, and pottery (Barum ware) are manuf. Pop. 16,300.

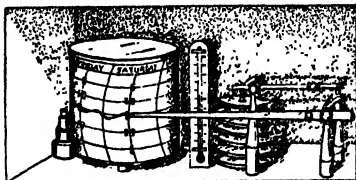
Barnum, Phineas Taylor (1810-91), Amer. showman, b. Bethel, Connecticut; entered a country store in 1823; went into the lottery business in 1828; in 1829 married and went to Danbury, where he ed. *The Herald of Freedom*. In 1834 he removed to New York and made a considerable profit by exhibiting Joyce Keth, supposed to be the nurse of George Washington. In 1841 he bought the Amer. Museum in New York, and made it famous by his collection of real and pretended wonders. In 1847 he acted as manager for Jenny Lind, and in 1871 estab. his 'Greatest Show on Earth,' his circus (q.v.). He pub. an autobiography, 1854 (enlarged in 1888), *Humbugs of the World*, 1865, *Struggles and Triumphs*, 1869, and *Money-getting*, 1883. *See* his life by Benton, 1902, and also M. R. Werner, P. T. Barnum, 1923, and H. W. Root, *The Unknown Barnum*, 1927.

Barocci, or Baroccio, Federigo (1526-1612), it. painter, b. and d. Urbino, son of eminent sculptor. Studied under Battista Franco, and was patronised by Cardinal della Rovere at Rome, whose palace he ornamented with frescoes. After 4 years he returned to Urbino, and painted a picture of St. Margaret for the Confraternity of the Holy Sacrament. At the invitation of Pope Pius IV. he assisted in the embellishments of the Belvedere palace, on which Zuccheri was also engaged. Here he executed the Annunciation in fresco on one of the ceilings, and a picture of the 'Holy Virgin with the Infant Saviour, with Saints.' His other works include an altar-piece of the 'Deposition' in the cathedral of S. Lorenzo at Perugia, and a picture of the 'Last Supper' for the church of Minerva. He worked in the manner of Correggio and had many disciples.

Baroque, Pierre Jules (1802-70), Fr. lawyer and politician, b. Paris; in 1847 he entered the Chamber of Deputies as member for Rochefort; in 1848 was elected to the Constituent Assembly; in 1850 became minister of the interior, and in 1851 minister of foreign affairs. Having become a supporter of Louis Napoleon, he was appointed president of the Council of State after the *coup d'état* of 1851, and in 1863 he became minister of justice. At the fall of the second empire in 1870 he fled to Jersey, where he d.

Baroda, in of India, 248 m. N. of Bombay, formerly cap. of princely state of B. under rulership of the gaekwar, a Mahratta chief. The tn has fine public buildings and wide streets.

Barograph, instrument by which the variations of atmospheric pressure are permanently recorded. The B. commonly used with barometers of the aneroid pattern (q.v.) consists of a system of levers by which the movements of the collapsible chamber are communicated to a pen which records the pressure on a chart wrapped round a rotating cylinder having a period of revolution of one day or one week.



ANEROID BAROGRAPH

Baroja, Pio (1872-). Sp. novelist. b. San Sebastian, of Basque descent. After 2 years as a country doctor, and 8 years as manager of his brother's bakery, he began to write novels at the age of 30. His books are full of adventure and rapid action, and are written in short, simple paragraphs; notably the *Memorias de un hombre de acción*, dealing with the War of Liberation. His severe attitude to life is best seen in *El árbol de la ciencia*, 1911, based on the story of his youth. His novels cover a vast field; some take place in the Basque provs. (*Las inquietudes de Shanti Andia*), others describe many different countries (*El mundo es así*). His pessimism is relieved by the speed of events, as well as by a lyrical strain in his writings. His *Obras completas* were pub. in 7 vols., 1947-8. Many of his novels have been trans. into English.

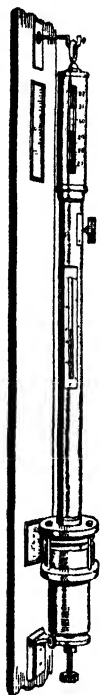
Barometer, instrument for measuring the weight or pressure of the atmosphere. The action of a suction pump in raising water was explained prior to 1643 by the principle that 'nature abhors a vacuum.' Galileo had observed that water could not be raised by the ordinary pump more than about 32 ft., and he recommended the study of the matter to his pupil Torricelli, who made the following experiment in 1643: a glass tube, about 3 ft. long, closed at one end, is completely filled with mercury and inverted, the open end placed in a trough of mercury, and the thumb removed. The mercury at once falls into the tube to within about 30 in. of the level of the mercury in the bath, the space above forming what is known as the Torricellian vacuum. As mercury is about 13.57 times as heavy as water (at 14° C.), Torricelli concluded that the force required to support the column of mercury

would support a column of water of the same diameter and about 34 ft. high, and that the action of the pump and the sustaining of the column of mercury both depended on the pressure of the atmosphere. The validity of the conclusion was proved by Pascal, who caused Torricelli's experiment to be performed on the summit of the Puy de Dôme. The column of mercury was found to be 3 in. lower, showing that the pressure supporting the liquid diminishes with ascent to higher levels of the atmosphere. Pascal also performed experiments with water, oil, and wine, and found that columns were supported the heights of which were inversely proportional to the sp. grs. of the liquids; and that in each case a weight of about 15 lb. of liquid was supported upon 1 sq. in. of surface. Any variations in the height of the Torricellian column are accounted for by variations in the pressure of the atmosphere, so that such an instrument acts as a B.

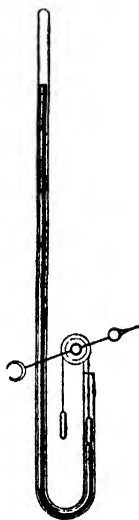
Cistern barometers. The simplest form of cistern B. consists of a glass tube about 33 in. long, containing mercury and dipping into a cistern also containing mercury. It is fastened to a wooden stand, on the upper part of which is a brass scale indicating the height above the average level in the cistern. The instrument is liable to the 'error of capacity'; that is, any diminution in the amount of mercury in the tube raises the level in the cistern, and vice versa, so that the scale does not always indicate the correct height of the column. In *marine B.s* this error is avoided by graduating the scale, not in true in., but in spaces which have been arrived at empirically as representing the correct height. In *Fortin's B.* the bottom of the cistern is made of leather, and can be pushed up by means of a screw until the surface of the mercury in the cistern touches the end of a fixed ivory point, which is the starting-point of the scale. It is necessary that the mercury column should be exactly vertical for the scale to give a correct reading. Another error to which cistern B.s are liable is due to *capillarity* (q.v.), or the reluctance of the surface of the mercury—a liquid which does not 'wet' the glass—to rise to the height determined by pressure. This error may be diminished by using tubes of more than eight-tenths of an in. in diameter.

Siphon barometers. The simplest form of siphon B. consists of a bent glass tube; one arm is about 36 in. long and is sealed, while the other arm is about 8 in. long and is open. Mercury is poured in and worked to the closed end until the long arm and part of the short arm are full. When placed with the closed end uppermost, the mercury falls until the level in the closed arm is about 30 in. above the level in the open arm. To make an observation, therefore, the height of the mercury in both arms must be taken, the difference giving the true barometric column. Owing to the subtraction, the error of capillarity disappears, and there is no error of capacity. The inconvenient nature of the observations, however, and the

possibility of impurities affecting the mercury at the open end, constitute such disadvantages that the instrument is not in favour for exact work. In the *Hooke* or *wheel B.*, the observations are rendered easier by placing a glass float in contact with the mercury, having attached to it a thread which passes over a pulley. The thread is pressed against the pulley by a small weight which almost balances the



FORTIN
BAROMETER



PRINCIPLE
OF WHEEL
BAROMETER

float. The movement of the pulley is communicated to a pointer which sweeps around a graduated dial, which also bears such inscriptions as 'stormy,' 'set fair,' 'very dry,' etc., giving information of doubtful value.

Corrections. In mercurial B.s for accurate work the scale is engraved on brass. The increase in length of the scale due to a rise in temp. is accurately known and tends to make the reading lower than it should be. On the other hand, the mercury also expands on a rise in temp., its density therefore diminishes, and the height of the column supported by the atmospheric pressure is greater than at

the standard temp., 0° C. or 32° F. The barometrical readings have therefore to be corrected for temp., and with many instruments tables are provided, indicating the corrections necessary to reduce the readings to 0° C. or 32° F. To apply the corrections for errors of capillarity it is necessary to know the internal diameter of the tube and the height of the *meniscus*, or curved surface. Reference to a table with respect to these 2 quantities will indicate the amount required to be added to the observed reading.

Variations in atmospheric pressure may be periodic or non-periodic. The 12-hr oscillation reaches its maxima in the tropics at about 10 hrs and 22 hrs G.M.T. and its minima about 4 hrs and 16 hrs G.M.T., but in the temperate zones these oscillations are usually masked by the passage of depressions and anticyclones, which occur irregularly. The lunar atmospheric tide can be detected, but its amplitude is very small. For many years the B. has been used to foretell weather, especially by seamen, but unless it is used in conjunction with a synoptic chart (see METEOROLOGY) it cannot be relied upon.

Uses of the barometer. As indicated above, the B. may be used to foretell weather conditions if the general weather situation is known. It is also used as an altimeter, or instrument to measure height above sea level, as the pressure of the atmosphere, unlike the temp., falls fairly regularly with height (see ATMOSPHERE, STANDARD). Standard atmospheric pressure is understood, in physics, to mean the pressure which supports at sea level, and at a temp. of 0° C., a vertical column of mercury 760 mm. high. In engineering the pressure of one atmosphere means a pressure equivalent to 15 lb. on each sq. in. of surface. In meteorology the standard pressure is represented in terms of force as one million dynes per sq. cm., this being equivalent to a barometric height of 29.513 in. or about 750 mm. at Greenwich, the acceleration due to gravity at that place being taken as 981.17 cm. per sec. The pressure of 1,000,000 dynes per sq. cm. is known as a bar, and, by international agreement, all meteorological observations of pressure are now given in millibars (mb.). See also ANEROID and METEOROLOGY. See F. C. Marvin, *Barometers and the Measurements of Atmospheric Pressures*, 1912; Sir R. T. Glazebrook (ed.), *A Dictionary of Applied Physics*, 1922-3; G. W. C. Kaye, *High Vacua*, 1927; London Meteorological Office, *The Observer's Handbook*. See also bibliography to article METEOROLOGY.

Barometz (Russian *barametz*, dimin. of *baran*, ram), prostrate hairy stem of a fern, *Cibotium barometz*, about which an extraordinary superstition arose. It was called Scythian lamb, and its shaggy appearance and crouching attitude gave rise to the fable that it was partly animal, partly vegetable, and devoured all plants in its vicinity.

Baron, Bernhard (1850-1929), Brit. tobacco merchant and philanthropist, b. at Brest-Litovsk, Russia, of poor Jewish parents. His father took him to America

and he began work as a boy in a New York tobacco factory. He invented a cigarette-making machine, unmarketable in America, which he brought to England and sold for £160,000. In 1903 he bought the small tobacco business of Mrs Carreras. He d. worth nearly 5 million sterling in spite of many generous gifts to charity. Benefactions were made from a charitable trust fund after his death and included a gift of £50,000 for rebuilding of St George's Jewish Settlement in the E. End of London; (1928) a trust of £500,000 to be used for hospitals and homes for orphans and crippled children during the succeeding 20 years; also gifts to endow a pathological institute, to the funds of the Brit. Empire Cancer campaign, and to build new research laboratories for the Royal College of Surgeons.

Baron, word of uncertain origin, introduced at the Norman Conquest to denote the 'man,' or vassal, of a lord. Originally the term was of wide application, but in England the process of limitation began early. The word was first restricted to those who held land directly from the king by military tenure, and by the 13th cent. the div. of these into greater and lesser B.s had become common. Magna Carta in 1215 provided that the lesser B.s should be summoned to the Great Council only through the sheriffs, while to the greater B.s, i.e. nobility from earls downward, a special summons should be sent by the king. This summons gradually became the badge of peerage, restricting the privilege to the greater B.s alone. Till this point the position of a B. was that of a holder of the king's land, but the personal note became dominant in 1387, when the creation of B.s by letters patent was inaugurated. In that year Richard II created John de Beauchamp B. of Kidderminster. The practice, however, did not become general until the reign of Henry VI. The creation of B.s by writ, formerly an ordinary proceeding, was almost entirely discontinued. The B.'s coronet (granted by Charles II) is a circlet surmounted by 6 balls known as pearls. B.s of the exchequer was the title long given to the 6 judges in the court of exchequer, and the name B.s of the Cinque Ports shows the retention of the freer use of the word. It designated the chief officials and parl. representatives of the 5 great SE. ports in the House of Commons. On the Continent the title was given a wider application than in Great Britain. In France only those bearing a name of historic note receive status from the title of B., and in Germany the title, which is handed down to all the children, became quite dissociated from all idea of possession of land.

Baron and Femme, or **Feme**, Norman-Fr. words used to denote husband and wife in their mutual relationship. In heraldry the words denote the bearing of the arms of husband and wife per pale, i.e. side by side on the same escutcheon, the husband's always being on the dexter side.

Baron of Beef, large piece of beef consisting of both sides of the back, a double sirloin, sometimes weighing 100 lb. This

huge joint was only served at great public entertainments, notably at civic feasts at Guildhall, London. The origin of the name is unknown, but legend ascribes it, as well as Sir Loin, to a jest of Charles II.

Baronet, title created by James I in 1611 to obtain funds for the defence of Ulster. Each B. was required to supply the funds for keeping 30 soldiers in Ireland (at the rate of 8d. per day) for 3 years. It was promised that the number of B.s created should not exceed 200, and it was also stipulated that the honour could only be conferred on a man who had a clear revenue of £1000 from lands, and whose family had borne arms at least as far back as his grandfather. It conferred the prefix 'Sir' on the B., and 'Lady,' or 'Dame,' on his wife, and gave him precedence over all other knights, but not over the younger sons of barons. B.s are entitled to bear on their arms an inescutcheon or canton charged with the red hand of Ulster. In 1625 Charles I instituted B.s of Nova Scotia in Scotland. This was a scheme for the colonisation of that colony, and grants of land were made to the new B.s, who paid 3000 marks for the honour. The number, not to exceed 150, was never completed. In 1629 they received the right of wearing a badge, suspended by an orange-tawny ribbon, with a saltire azure, thereon an inescutcheon of the arms of Scotland, surmounted by an imperial crown, round the whole a motto, *Eaz mentis honestae gloria*. Later, 1707, they were created B.s of the U.K. Since 1800 all new baronetcies are of Great Britain.

Baronius, Caesar (1538-1607). It. eccles. historian. b. Sora in Naples, the son of Camillo Baronio and Porzia Fehoria. He studied divinity and law at Naples, and afterwards at Rome, where he became a disciple of St Philip Neri, whom he succeeded as superior of the congregation of the oratory, 1593. In 1596 he was made cardinal, and in 1597 librarian of the Vatican; but failed to become Pope in 1605 owing to the opposition of the Spaniards. His most celebrated work, *Annales Ecclesiastici a Christo Nato ad Annum 1198* (12 vols., 1588-1607), was written in reply to the Protestant work entitled *Magdeburg Centuries*, and its object was to show that the doctrine of the Church of Rome was identical with that of the early Christian Church. Another work of B. worthy of note is *Martyrologium Romanum*, 1586. According to Mazzuchelli (*Scrittori d'Italia*, vol. Brescia, i, pt i, p. 387), there are 19 works of B. in print and MS.

Barons' War, *The*, see MONTFORT, SIMON DE.

Baronscourt, Irish seat of the Duke of Abercorn in co. Tyrone, N. Ireland, 3 m. W. of Newtown Stewart. Also the name of a London dist. between Earl's Court and Hammersmith, on the Dist. Railway.

Baroque, from Portuguese *barroco*, a term originally applied by jewellers to a pearl of irregular form; then to a 17th-cent. revolt in architecture against the rigid conventions of Palladio (see ARCHITECTURE (6)); and lately to sculpture, to

painting, and even to music. See M. S. Briggs, *Baroque Architecture*, 1912, and S. Sitwell, *Southern Baroque Art*, 1924.

Baroscope, type of barometer which indicates only variations of the atmospheric pressure, and does not, as the ordinary barometer does, supply any quantitative data.

Barosma, **Buchu**, or **Bucku**, genus of evergreen S. African shrubs, family Rutaceae; *B. crenulata* and other species provide the Buchu leaves, with medicinal properties, of commerce. *B. pulchella* is a purple-flowering shrub for cool green-houses in Britain.

Barotac, or **Barotag**, Nuevo, tn of Panay Is., Philippine Is., situated in a fertile dist. of Iloilo. Sugar is grown and milled. Pop. 21,860.

Barotseland, former kingdom of central Africa, in the Upper Zambesi. It now forms the dist. of NW. Rhodesia, and is a native reserve and part of the Federation of Rhodesia and Nyasaland (q.v.); Europeans, except for missionaries, traders, and officials who have been approved by the paramount chief, not being permitted to settle. Lewanika (q.v.), who d. in 1916, put B. under Brit. protection. He was succeeded as paramount chief by his son, Yeta III, who was succeeded by Mwanawina III, who supported the idea of federation against his fellow chiefs in N. Rhodesia and Nyasaland. The dist. is well watered and fertile, and supports a large pop., the Barotse being the most capable and adaptable of the N. Rhodesian natives. Many of them are Christians. The migration to the N. and S. Rhodesian and S. African mines of so many of the younger men involves their detribalisation, with consequent hardship to their families through the destruction of their social organisation. Lealui is the cap. and the residence of the chief, but Mongu, 7 m. away, is the chief station and Brit. residency. Other stations are Nakolo and Shesheke. There is a postal service from Lealui to Bulawayo. See D. W. Stirke, *Barotseland*, 1922.

Barousse, valley in the Hautes-Pyrénées, France.

Barozzi, or **Barocchi**, see VIGNOLA.

Barque, or **Bark**, originally any small ship, but later more particularly a 3-, 4-, or 5-masted sailing vessel, with all masts square-rigged, except mizzen-mast rigged fore and aft, i.e. in a line with the run of the ship. Formerly they were small vessels only, later 4-masted steel B.s ranged between 2300 and 3000 tons. Ocean-going sailing vessels, including B.s, are now virtually obsolete. See SEAMANSHIP.

Barquisimeto, cap. city of state of Lara, Venezuela, on headstream of Cojedes R., 166 m. NW. of Caracas. It is a bishop's see, the third largest city of Venezuela, and contains a college, cathedral, gov. palace, etc. It stands in a fertile agric. and stock-raising dist., and has every type of light manuf. It does a large trade through its port, Tucacas, and has its own airport. Pop. 105,108.

Barr, **Amelia Edith**, née Huddleston

(1831-1919), Amer. novelist, b. Ulverstone, Lancs, England. She went to Texas with her husband in 1853, and after his death in 1869 removed to New York. Among her numerous novels are *Jan Vedder's Wife*, 1885, *The Bow of Orange Ribbon*, 1886, *Remember the Alamo*, 1888, *The Belle of Bowling Green*, 1904, *The House on Cherry Street*, 1909, and *The Paper Cap*, 1918. *All the Days of My Life*, 1913, is an autobiography.

Barr, **Archibald** (1855-1931), Scottish inventor, b. in Renfrewshire. Educ. at Paisley and Glasgow Univ., where he was regius prof. of civil engineering and mechanics, 1889-1913. Invented, with Stroud, naval range-finders, adopted by Brit. Admiralty and foreign govts.; also various range-finders for fortress and field service, electrical fire-control instruments for use between fire-control positions and gun stations of war-vessels (adopted by Brit. Admiralty), and a pump for producing high vacua. Also inventor of height-finders for the anti-aircraft services, torsion dynamometers and power meters, instruments for use in air surveying, and improvements in the optophone.

Barr, **Robert** (1850-1912), novelist, b. Glasgow. Taken to Canada while a child, he was educ. at the Normal School, Toronto. He became a reporter on the *Detroit Free Press*, for which he wrote under the pseudonym Luke Sharp. In 1881 he returned to Britain and collaborated with J. K. Jerome (q.v.) in founding and editing *The Idler*. A facile writer of fiction, he is remembered by *The Triumphs of Eugene Valmont*, 1906, which introduced a comic Fr. detective who in some ways anticipates Agatha Christie's Belgian Hercule Poirot.

Barr, **Fr.** tn in the dept. of Bas-Rhin. It has mineral baths, and manufs. hosiery and leather goods. Pop. 4300.

Barra, is. of Inverness-shire, Scotland, near the S. extremity of the Outer Hebrides. Historically it is famous as the scene of the victory of Robert Bruce, 1308. Pop. 1728.

Barra Mansa, Rio de Janeiro state, Brazil, on the r. b. of the Paraíba do Sul. Industrial centre with metal works and flour and textile mills. It is 5 m. WSW. of the new steel city of Volta Redonda. Pop. 21,340.

Barrackpur, on R. Hugli, is a well-known suburb, 15 m. N. of Calcutta, India. In a fine park bordering the riv. is a house, formerly the country residence of the viceroy and later of the Governor of Bengal. Here too is an up-to-date electric generating station.

Barracks, set of buildings with all conveniences for human habitation and generally used for the accommodation of units of the fighting forces and police. The nature, site, and construction of B. were usually determined by the strategic or other employment of the troops, etc., which had to occupy them. Hence those of the sovereign's bodyguard were built in London and at places near the royal residences; B. near the coast were constructed more in the nature of

forts; whilst the sites of those at depots in the country were chosen more for health reasons. The B. include parade ground and open spaces for drill and manoeuvres. B. are generally built in blocks, and are divided into officers' quarters, men's quarters, and quarters for married soldiers and sergeants. The officers' mess usually consists of a dining-room, ante-room, billiard-room, and offices. Each officer has his own private rooms, the number varying according to rank, and special accommodation is made for married officers. The married soldiers usually have separate houses each, with rooms varying in number according to the number of their children. The soldiers are catered for by the regimental institute, which consists of the canteen and the recreation estab. Reading-rooms, coffee bars, gymnasia, billiard-rooms, and other recreation rooms are provided in B. to make the life as comfortable and attractive as possible. There are separate buildings constructed and set apart for hospitals, garages, stores, miniature rifle ranges, guard-rooms, cook-houses, schoolrooms for children, and, in the larger garrisons, garrison schools and libraries.

Formerly accommodation was not provided for soldiers, and it was not till the end of the 18th cent. that permanent buildings for soldiers came to be built. Before this period soldiers were accommodated in scattered billets, which was unsound from a tactical point of view when troops were needed to turn out suddenly against a threatened point or to proceed on special duty where speed was essential. At the H.Q. of every fighting force there is a dept. charged with the duty of looking after B. in all their aspects, including prevention against fire.

Barracuda, Barracouta, or Barracoota, large pike-like fish of the family Sphyracnidae and order Percomorphi. B.s are carnivorous, and some varieties are esteemed as a food, though at times they are poisonous. They are related to the grey mullets (Mugilidae). **Barracouta** is also the Australian and New Zealand name for the snoek (*Thyrsites atun*).

Barratranca, tn in Sicily (q.v.), situated 1470 ft above sea level, 14 m. SSW. of Enna (q.v.). Pop. 10,000.

Barrage: 1. Engineering: an artificial obstruction placed in a water-course to obtain increased depth of water.

2. Artillery: a curtain of shell-fire produced by a number of shells being fired simultaneously by guns on to a definite line. A B. differs from a bombardment (q.v.) in that in the former the fall of the shells takes a linear formation, whereas in the latter they are grouped over an area. B. fire was introduced in the First World War, when, as communications were difficult, it became necessary for B. fire to be prearranged and carried out according to a definite time-table. The procedure was for artillery to 'put down' a 'creeping' B. on a certain line for a certain time during which the infantry moved forward as far as possible under the protection of the falling shells. The B. was usually

put down on an objective which the infantry prepared to assault as soon as the B. 'lifted.' At the time scheduled the B. would come down on the next objective, and the same procedure would be repeated until the B. had 'crept' to its final position, where it 'stood' for a time, and thus became a 'standing' B. Creeping B.s were used to screen troops in retreat as well as in advance, and a 'flank' B. was used to give protection to troops on their flank. A combination of the creeping and flank B. was a 'box B.', which gave all-round protection. See also under ANTI-AIRCRAFT DEFENCE and ARTILLERY.

Barramunda, name applied to the Australian lung-fish, *Neoceratodus forsteri*. Its haunts are the rivers of Queensland.

Barranquilla, city, cap. of Atlántico dept, Colombia, on Magdalena R., near its mouth, and a leading airport and seaport centre. It is the largest commercial centre in Colombia, and handles half her foreign trade, has many manufs., and exports coffee and hides. Pop. (1951) 279,627.

Barrantes, Vicente (1829-98), Sp. poet and publicist, b. Badajoz. He held sev. appointments in Spain and the Philippines, and in 1872 was made a member of the Sp. Academy. His works, for the audacity of which he was sev. times fined, include *Siempre Tarde*, 1851, *Juan de Padilla*, 1855-6, *Narraciones Extramurales*, 1872-3, *Cuentos y Leyendas*, 1875, and *Guerras Piráticas de Filipinas*, 1878.

Barras, Paul Jean François Nicolas, Comte de (1755-1829), Fr. revolutionary, b. Foix-Amphoux in Var, of an old and noble family. In 1775 he entered the army, and served in India. When the revolution commenced he became one of its warmest supporters, and was a member of the Jacobins' Club from its beginning. Representing Var in the National Convention, he voted for the death of Louis XVI. and he also took an active part in the siege of Toulon. He opposed Robespierre, and helped to bring about his downfall. On the 13th Vendémiaire (5 Oct. 1795), the Convention appointed B. General-in-Chief for the second time, and his success on this occasion was chiefly owing to Bonaparte, to whom he had given the command of the artillery. The anarchists were put down and B. was nominated one of the 5 members of the Directory. After the estab. of the Consulate, 1799, B.'s power ended. Implicated in a conspiracy, he was exiled to Rome, but returned to Paris in 1814.

Barratry (from O.F. *baraterie*, fraud) is in Eng. law the offence of habitually moving, exciting, or maintaining suits or quarrels in the courts. A person accused of the offence must have allegedly committed at least 3 breaches of this law and is described as a 'common barrator.' Eng. lawyers guilty of B. are barred from practising. The crime is now rare. The offence in Scotland is not the same, but is the crime of a judge who barter justice for money, i.e. is guilty of corrupt practices. The offence of B. is also known in marine insurance: in that case it is an offence by

the masters or crew of a ship which is to the detriment of the owners or insurers of that ship. It is usually insured against in marine insurance policies.

Barraut, Jean-Louis (1910-), one of the outstanding Fr. actor-managers. He joined the Comédie Française in 1940, where he became outstanding for his clarity of voice and natural methods. In 1946 he left the Comédie Française and has since been an actor-manager. One of his most notable roles is Hamlet in the trans. by André Glide.

Barre, Isaac (1726-1802), Irish soldier and politician, b. Dublin, the son of a Fr. refugee and educ. at Trinity College, Dublin. B. served under Wolfe and was wounded at Quebec in 1759. He entered Parliament in 1761, and consistently defended the rights of the colonies, notably in a famous speech against the Stamp Act in 1765. He was the originator of the term 'Sons of Liberty' applied to the Americans.

Barre, tn of Washington co., Vermont, U.S.A., 6 m. SE. of Montpelier, famous for its granite quarries. Pop. 10,922.

Barre, name given to a group of S. Amer. tribes of Arawakan stock, who occupy the country round the Upper Rio Negro, in N. Brazil. They are an independent, progressive race, their language being spread throughout a wide region.

Barrel, see METROLOGY.

Barrel Organ, portable mechanical musical instrument with a limited number of tunes. Provided with hymn tunes, it was formerly used in some churches, but was ousted by the harmonium; at the end of the 18th cent. it was first used in the street. The organ has a wooden cylinder furnished with pegs or staples which, when revolved, opens a series of valves to admit the air to a set of pipes, and thus produces the sounds.

Barrel-vault, or Tunnel-vault, in architecture, a continuous semicircular arch or tunnel of brick, stone, or concrete; used from very early times, especially in Rom. and Romanesque architecture (see VAULT).

Barrelier, Jacques (1608-73), Fr. botanist, b. Paris. He was educ. for the medical profession, but abandoned it, and in 1635 joined the Dominicans. In 1646 he was appointed assistant to the general of the Order, and traversed S. France, Spain, and Italy. During his travels he collected plants, of which he made drawings, and had them engraved. He returned to Paris, 1672, to complete his work, but d. in 1673. After his death his collections were dispersed, and some were burnt. The copper plates, however, were collected and pub. by Antoine de Jussieu, who supplied descriptions in the place of those which had been destroyed.

Barren, or Blind, Flowers are more commonly known as male flowers. They bear stamens but not pistils.

Barren Island, name given to 4 different is. in various parts of the world. The first is a sandy is. off the S. shore of Long Is., King's co., New York. The second is an is. on the W. coast of Placentia Bay, off Newfoundland. The third is one of the group known as Hunter Is., off the NE.

point of Tasmania. The fourth is a volcanic is. in the Bay of Bengal, situated to the E. of the Andaman Is.

Barrenness, see STERILITY.

Barrenwort (*Epidemum alpinum*), family Berberidaceae, a S. European herb, naturalised in Britain. It is a self-pollinated plant, with nectararies, and the seed has a membranous aril.

Barres, Auguste Maurice (1862-1923), Fr. politician and man of letters, b. Charnes-sur-Moselle. After studying at Nancy he went in 1882 to Paris and became a journalist. He was elected a deputy for Nancy in 1889 and sat in the chamber until 1893. Later he was returned for the Seine div. and elected a member of the Académie Française. He was an individualist and a nationalist, becoming a leader of Fr. aspirations in Alsace-Lorraine. Besides his political works he wrote a great deal of fiction and some dramas. His works include *L'Ennemi des lois*, 1893, *Une Journée parlementaire*, 1894, *L'Am française et la guerre*, 1915, and *Le Génie du Rhin*, 1921. See studies by J. N. Faure-Biguet, 1924, and A. Blanc-Peridier, 1925.

Barret, George, the Elder (1728?-84), Irish landscape painter, b. Dublin where he learnt to draw, settled in London, 1762. He was one of the original members of the Royal Academy, founded 1768; and towards the close of his life was master painter to Chelsea Hospital. His son, George B. the younger (d. 1842), was also a painter, mainly noted for landscapes in water colour, exhibiting at the Royal Academy and Society of Painters in Water Colours.

Barrett, Eaton Stannard (1786-1820), poet, b. Cork. He studied at the Middle Temple, and in 1810 wrote *Woman and Other Poems*, which he followed with a number of political satires.

Barrett, John (1866-1938), Amer. arbitrator, b. Grafton, Vermont. B. was Amer. minister to Siam in 1894-8, when he settled by arbitration large Amer. claims in that country. He was U.S. delegate in 1901-2 to the second Pan-American Conference, Mexico; and 1907-1920, director of the Pan-American Union, which he developed as the prin. official agency for fostering the growth of Pan-American trade.

Barrett, Lawrence (1831-91), Amer. actor, b. Paterson, New Jersey. He made his first appearance on the boards at Detroit, Michigan, as Murad in *The French Spy* in 1853. In 1857-8 he was associated with the brilliant actor Edwin Booth; subsequently he became the leading member of his company, and worked with him from 1887 till his death. B. was a versatile actor and had a high understanding of his art. His best part was Jussius; he also took the leading parts in many Shakespearean plays. He wrote *Edwin Booth and his Contemporaries*, 1886.

Barrett, Sir William Fletcher (1844-925), physicist, b. Jamaica. Educ. in Manchester. In 1863 he was working as assistant to Prof. J. Tyndall and from 1873 to 1910 was prof. of physics at Dublin

Univ. He did effective research work on alloys and especially on their electric and magnetic purposes. 'Stalloy,' a silicoen iron used by electrical engineers, was his discovery. His prin. research work, however, was in the uses of the divining rod. Was lecturer in physics in the Royal School of Naval Architects, also one of the founders of the Society for Psychical Research.

Barrett, Wilson (1846-1904), actor, b. Essex. He first appeared at Halifax in 1864 in *East Lynne*. As manager of the Princess's Theatre he produced *The Lights of London* and *The Silver King*. In 1884 he appeared in *Hamlet*, and later visited America and Australia. In 1895 he produced *The Sign of the Cross*.

Barrethead, burgh of Kenfrewshire, Scotland, 7 m. SW. of Glasgow by rail. Porcelain and sanitary appliances are manuf., and it contains also cotton mills, bleaching and dyeing works, engineering works, and shawl-weaving mills. Pop. 13,000.

Barri, Giraldu de, see GIRALDUS CAMBRENSIS.

Barrias, Louis Ernest (1841-1905), Fr. sculptor, b. Paris. He studied at first under Léon Cogniet, but recognising that sculpture was his true *métier*, he worked under Jouffroy. He was awarded the Prix de Rome in 1865, and a medal at the Salon of 1870. His 2 works for the Salon of 1872, one in marble, the other in bronze, were of such excellence that he was awarded a first-class medal. He was awarded a medal of honour and a decoration for his piece at the 1878 Salon, entitled 'The First Funeral,' representing Adam and Eve bearing Abel's body.

Barricade, military term used for any obstruction formed to check the advance of an enemy. B.s may be constructed of palisades and earth or sand-bags, with loop-holes cut for firing, but as they are generally thrown up in haste any material to hand, such as loaded carts, heaps of stones, planking, felled trees, etc., is used. In 1358 B.s were set up in the streets of Paris against the Dauphin Charles, and again in 1588 Henry IV's troops were prevented from entering Paris by the B.s. They were used again in Paris in the insurrections of 1848 and 1871.

Barrie, Sir James Matthew, Baronet, O.M. (1860-1937), novelist and playwright, b. Kilmuir in Forfarshire (the 'Thrums' of his novels), the son of a weaver. Educ. at Glasgow Academy, Dumfries Academy, and Edinburgh Univ., he planned from boyhood to be a writer. In 1883 he joined the staff of the *Nottingham Journal*, and 2 years later, having estab. a connection with some London papers, he moved there and for 5 or 6 years supported himself with growing confidence and reputation by articles in various periodicals. During this period 'When a Man's Single' appeared in the *British Weekly* under the pseudonym Gavin Ogilvy, and 2 series of sketches, *Auld Licht Idylls*, 1888, and *A Window in Thrums*, 1889, were pub. His first real novel, *The Little Minister*, 1891, was an immediate success. In 1894 he married Mary Ansell, an actress, and settled in Kensington, where he wrote 3

more novels of Scottish life: *Margaret Ogilvy*, 1896, a tribute to his mother's memory; *Sentimental Tommy*, 1896; and its sequel *Tommy and Grizel*, 1900. His first full-length play, *Walker, London*, had appeared in 1892, and in 1898 *The Little Minister* was dramatised, eventually bringing him £80,000. Thenceforward he turned from novels to playwrighting, the sentimental comedy of *Quality Street*, 1901, and the social satire of *The Admirable Crichton*, 1902, being followed by what is usually reckoned his greatest work, *Peter Pan*, in 1904. The success of this epic of boyhood, which is a fairy-tale mixed with the essence of all the best adventure stories, with pirates and redskins playing leading parts, was tremendous, and 50 years later it was still one of the most popular plays for children when it was put on every winter. Its immortality is reflected in the statue of Peter Pan which B. had set up in Kensington Gardens, the original home of the 'boy who wouldn't grow up.' No other play of B.'s followed similar lines, the nearest to it being the fantasy *A Kiss for Cinderella*, 1916. His later productions, in the vein of whimsical satire which he made peculiarly his own, include *What Every Woman Knows*, 1908, and *The Twelve-Pound Look*, 1910, both excellent satirical comedies; *Dear Brutus*, 1917, the theme of which is that each man carries his destiny within himself; *Mary Rose*, 1920, an eerie fantasy; and *Shall We Join the Ladies?*, 1921, an uncompleted murder story. His last play, *The Boy David*, 1936, which had a biblical subject, was written especially for Elisabeth Bergner, who appeared in the title role in London and Edinburgh in 1937. In 1909 B. obtained a divorce from his wife and moved to the Adelphi, where he had Bernard Shaw for a neighbour. In 1913 he was made a baronet, and in 1922 he received the Order of Merit and as Lord Rector of St. Andrews Univ. delivered a noteworthy address on 'Courage.' In 1930 he was elected Chancellor of Edinburgh Univ. See J. A. Roy, *J. M. Barrie, an Appreciation*, 1937; P. R. Chalmers, *The Barrie Inspiration*, 1938; W. A. Darlington, *J. M. Barrie*, 1938; D. Mackall, *The Story of J. M. B.*, 1941; G. Blake, *Barrie and the Kailyard School*, 1951; Lady C. Asquith, *Portrait of Barrie*, 1955.

Barrie, cap. tn of Simcoe co., Ontario, Canada, on Kempenfeldt Bay, Lake Simcoe, 64 m. NW. of Toronto. It is a railway centre, and has manufs. of carriages, wool, leather, and machinery. Pop. 16,000.

Barrier (Fr. *barrière*), in fortification, term applied to a chain of military posts protecting the frontiers of a country. It signifies also a wall of strong timbers enclosing an area (stockade), or protecting a passage. In some part of a B. is a gate usually formed of 2 parts, opening in the middle, and frequently proof against small-arms fire, being made of strong timbers in vertical and horizontal positions, with diagonal braces.

Barrie Act, Act passed by the General Assembly of the Church of Scotland in

1697 providing that any proposed change in the Church laws anent 'doctrine or worship, or discipline or government' must be sanctioned by a majority of the Presbyterians. The object of this Act was to guard against hasty legislation in the Church.

Barrier Reef, The Great, see GREAT BARRIER REEF.

Barrier Treaties, name given to 3 treaties which were drawn up during or immediately after the war of the Sp. Succession. It was essential to the Dutch that, in order to resist possible Fr. aggressions, they should have control of the 'barrier' fortresses of the Netherlands. The chief fortresses which the Dutch demanded were Ypres, Tournai, Mons, Charleroi, and Ghent. In return for a recognition of the Protestant and Hanoverian succession, Great Britain signed a treaty in 1709 by which she undertook that the Dutch should be provided with an adequate barrier of fortresses in the Netherlands. The number of fortresses was reduced by the second treaty to practically only those already named (1713). The third of the treaties, signed 1715, was supplemental.

Barring-out, practice formerly common in schools, by which the boys barred the doors of the school against the master. The time chosen was usually a few days before the commencement of the vacations. Addison was the leader of a B. at the Grammar School, Lichfield, 1685 (see *Johnson's Life of Addison*); and at the High School, Edinburgh, in 1595 there was a serious B. in which a magistrate lost his life whilst endeavouring to force an entrance. In the statutes of Witton School, near Northwich, in Cheshire, founded by Sir John Deane, 1558, the observance of the custom by the scholars is directed.

Barrington, Daines (1727-1800), jurist, fourth son of John Shute B. He was called to the Bar in 1749, and made a pulene Welsh Judge in 1757. In 1785 he gave up all public employments except the place of commissary-general of the stores at Gibraltar. Of his writings the most important is *Observations upon the Statutes, chiefly the more ancient, from Magna Carta to the 21 Jac. I. c. 27*, first pub. 1766.

Barrington, George, real name Waldron (1755-1804), convict, b. near Dublin. He became an expert pickpocket at an early age, and in 1780 was sentenced to be transported. Arriving in Sydney in 1791 he ingratiated himself with the authorities, became chief constable of Parramatta and later superintendent of convicts. He d. insane. Sev. books about New S. Wales have been attributed to him, but there is no evidence that he wrote them, nor did he write the famous prologue with the line 'We left our country for our country's good,' which was actually composed by Henry Carter. See R. S. Lambert, *The Prince of Pickpockets*, 1930.

Barrington, John Shute, 1st Viscount (1678-1734), polemical writer and politician, b. Herts and called to the Bar in 1699. B. was one of the commissioners

sent to Scotland to gain the favour of the Presbyterians for the Union; he entered Parliament in 1715. In 1720 he was made baron and viscount in Ireland. He was expelled from Parliament in 1723 for his connection with the Harburg lottery. He wrote a number of works on the rights of Protestant Dissenters.

Barrington, Rutland (1853-1922), actor, b. Penge, son of J. G. Fleet (B. being a stage name), and nephew of Emily Faithfull. Educ. at Merchant Taylors' School, he made his first appearance on the stage at age of 21; thereafter he joined the D'Oyly Carte management and played in all Gilbert and Sullivan operas except *The Yeomen of the Guard*. He also had a distinguished career in musical comedy and straight plays. He wrote humorous articles for *Punch*, also one play.

Barrington, Samuel (1729-1800), Brit. admiral, son of Viscount B. Entered the navy under Lord George Gordon in 1740; became a lieutenant in 1745; commanded the sloop *Weasel* in 1747; and later in that year, in the *Bellona*, captured the Fr. *Duc de Chartres*. He served in the Mediterranean and on the Guinea coast; in 1754-5 accompanied Commodore Keppel to N. America; in 1757 served under Sir Edward Hawke in the Basque Roads expedition; and in 1761 under Koppel at Belle Isle. In 1759, while commanding the *Achilles*, he captured the *Comte de St Florentin*. He was made commander-in-chief in the W. Indies in 1778, where he defeated the French under d'Estaing. He was in the action off Grenada in 1779, and was second in command to Lord Howe at the relief of Gibraltar in 1782. He was made an admiral in 1787.

Barrington, Shute (1734-1826), Eng. churchman, sixth and youngest son of John Shute, Viscount B., b. Becket, Berks. He was educ. at Eton and Merton College, Oxford. He was ordained in 1756, and appointed chaplain-in-ordinary to George III in 1760. He was made canon of Christ Church in 1761, and took his D.C.L. in the following year. He was appointed a canon of St Paul's in 1768, and Bishop of Llandaff in 1769, of Salisbury in 1782, and of Durham in 1791. He was a defender of the Protestant estab., and opposed to the acquisition of political power by the Rom. Catholics, though he showed great hospitality to emigrant Fr. clergy. He left many bequests to charity.

Barrios, Justo Rufino (1835-85), Guatemalan politician, b. San Lorenzo, Guatemala. He took part in the unsuccessful liberal insurrection under Serapio Cruz against Cerna, the president of Guatemala, in 1867-9. He was obliged to flee to Mexico, but in 1871 he returned and defeated Cerna, and assisted in making Granados president. Two years later he overthrew Granados and took his place, being re-elected in 1876 and again in 1880. Seeing that his ideal of a union of Central Amer. states would never be attained by peaceful means, he invaded Salvador in an attempt to bring about his aims by force. He was, however, defeated and killed at Chalchurapa.

Barrister, member of that branch of

the law which has the exclusive right to practise and be heard in the superior courts of law in England and Ireland. For the Scottish equivalent branch see *Advocate*. The right to practise at the Bar is confined to the 4 Eng. Inns of Court (q.v.), viz. Lincoln's Inn, Inner and Middle Temples, and Gray's Inn, and to the King's Inns in Ireland. A student is 'admitted' to an Inn by passing a preliminary examination (excused for those who have passed certain univ. examinations), and paying fees. He then 'keeps' 12 terms by eating dinners in the hall of his Inn, 6 in each legal term (3 for univ. members). On passing the examinations of the Council of Legal Education and paying fees he is 'called to the Bar' by the benchers of his Inn, who may refuse to admit. They also may 'disbar' or expel a B. for misconduct. On his call or before, a B. usually passes a year as pupil in the chambers of a practising B. and if he intends to practise at the common law

criminal cases he may be engaged directly in open court. He drafts 'pleadings' (q.v.), gives opinions on the case, advice on evidence, etc., and it is his especial and peculiar function to conduct the case in court. A B. is not answerable for anything said by him in court so long as it is suggested by his instructions and is relevant to the case. He may not sue for his fees, but is not obliged to return them though he cannot attend the court. He is not liable for negligence. The attorney- and solicitor-generals are leaders of the Bar; queen's counsels (Q.C.s) are appointed by the lord chancellor on application; they are called 'within the Bar' and are said to 'take silk,' their gown of special form being of silk for dress occasions, when they also wear a full-bottomed wig (see *QUEEN'S COUNSEL*). The ordinary B., or junior Bar, wears a 'stuff' gown. Counsel do not wear wig or gown when appearing before justices of the peace.

Barron, Clarence Walker (1855-1928), Amer. financial editor and publisher, b. Boston, Massachusetts; educ. in the English High School in that city, and d. at Battle Creek, Michigan. He began his career by joining, in 1873, the staff of the Boston *Daily News*, in which his article on the debate between Wendell Phillips and Wm Lloyd Garrison attracted much attention. Joining the *Boston Transcript* in 1875, he founded, 12 years later, the Boston News Bureau, an agency publishing financial news in a daily bulletin. After founding a like agency in Philadelphia, he went to New York in 1901. Bought the *Wall Street Journal* in the same year and founded *Barron's National Business and Financial Weekly* in 1921. Wrote among other books *War Finance*, 1919, and *A World Remaking*, 1920.

Barron, James (1769-1851), Amer. commodore, b. Virginia; entered Amer. Navy in 1798; in 1806 surrendered the *Cheapeake* to the Brit. frigate *Leopard*. He was court-martialled and removed from the service for 5 years. In 1820 he

challenged Decatur (an officer whom he suspected to be principally instrumental in keeping him ashore) to a duel, and mortally wounded him; he was wounded himself, but recovered, and in 1851 d. in Norfolk, the senior officer of the Amer. Navy.

Barros, João da (1496-1570), Portuguese historian. In 1522 he was sent as governor to St George del Mina or São Jorge da Mina, on the Guinea coast; in 1525, recalled to Lisbon, he was appointed treasurer to the colonial dept, and afterwards agent-general for the colonies. While he held this office he composed his work, *Asia portuguesa*.

Barros-Arana, Diego, Chilean historian (1824-1907). He was prof. of geography at the univ. of Santiago, and Chilean minister at Buenos Aires. He formed one of the commission which studied the delimitation of the frontier between Chile and the Argentine Rep. His works, which are in Spanish, include *General History of the Independence of Chile*, 1854-1857, *Elements of Physical Geography*, 1881, and *General History of Chile*, 1884.

Barrosa, Sp. vil. in the prov. of Cádiz, 16 m. SE. of Cádiz city. The French were defeated here in 1811 by Gen. Graham (see *LYNEDECH, BARON*) during the Peninsular War.

Barrot, Camille Hyacinthe Odilon (1791-1873), Fr. orator and statesman, b. Villefort. He studied law in Paris, and was called to the Bar there. Though a supporter of monarchy, he was dissatisfied with the restoration gov.; he took a prominent part in the revolution of July 1830, being a member of the municipal commission of the Hôtel de Ville, and one of the 3 commissioners appointed to conduct Charles X out of France. He at first supported Louis Philippe, and was appointed prefect of the Seine dept, but later went into opposition. The revolution of 1848 came as a surprise to him, however, but he acquiesced in the rep., and accepted office, but was soon dismissed. After the *coup d'état* of 1851 he retired into private life. After the fall of the empire, Thiers nominated him president of the Council of State, but he d. a year later.

Barrow, Isaac (1630-77), Eng. divine and mathematician, son of the linen-draper to Charles I; educ. at Charterhouse and Felsted; entered Peterhouse College, Cambridge, 1643, under his uncle, who was a fellow. The Presbyterians having taken possession of Peterhouse, B. removed to Trinity College, Cambridge. He became a fellow in 1647; took his M.A. 1652, and was made D.D. by royal mandate in 1670. He first intended to study physic, but turned to theology; gradually he was led to astronomy and geometry. Meanwhile he studied the classics and was recommended for the chair of Greek at Cambridge; he lost it, being suspected of Arminianism. Then he went abroad (1655-9), travelling through Europe. He was ordained in 1659. In 1660 he was chosen Gk prof. and in 1662 Gresham prof. of geometry, but this he resigned on his appointment to

he Lucasian prof. of mathematics, 1663. This he resigned (1669) in favour of his great pupil Isaac Newton. In 1677 Charles II (whose neglect of him he celebrated in his well-known *Lat. lines*) appointed him master of Trinity College and he exerted himself to form a library. He never married. His 2 mathematical works were *Lectiones Opticae* and *Lectiones Geometricae*, both of which were esteemed by Newton. Among his theological works are *Exposition of the Creed, Decalogue, and Sacraments*, 1669. His treatise on the Pope's supremacy is still admired as a specimen of controversy. An ed. of his theological works was ed. by Napier (9 vols.), 1859.

Barrow, Sir John (1764-1848), diplomat, writer, and patron of Arctic exploration. b. Dringley Beck, Lancs. He became a time-keeper in a Liverpool iron foundry, but managed to educate himself. After a trip to sea in a Greenland whaler he became a teacher of mathematics in Greenwich. Here he was fortunate enough to secure the interest of Sir George Staunton, who obtained for him (1792) the post of secretary to Lord Macartney the first Brit. ambas. to China. He mastered the Chinese language and studied Chinese literature and science. On the appointment of Macartney to the governorship of the Cape of Good Hope, B. took part in the settlement of the affairs of that colony. From 1804 to 1845 he was second secretary of the Admiralty. He was made a baronet in 1835. He was a fellow of the Royal Society, and one of the chief founders of the Royal Geographical Society. His publs. include *History of Voyages into the Arctic Regions*, 1818, an autobiography, 1847, and various books of travel.

Barrow, riv. of Rep. of I., rising on the NE. side of Slove Bloom Mts. Leix, and flowing E. to the border of Kildare, then S. With the Suir, which it joins 29 m. from the sea, and the Nore, which flows into it 2 m. above New Ross, it forms the estuary of Waterford harbour. Navigable for barges up to Athy, where it joins the Grand Canal. Length 119 m.

Barrow, Point, most northerly point of Alaska. There is a U.S. naval base and meteorological station near the point.

Barrow-in-Furness, seaport, manufacturing tn, and municipal co., and par. bor., Lancs, England, 9 m. SW. of Ulverston, 268 m. NNW. of London. Here are situated the famous shipbuilding yards of Vickers-Armstrongs, Ltd, the Bessemer steel works, and other large industries connected with iron and copper, which are found in the vicinity. There are also engineering shops, paper and pulp works, etc. There is an active trade at the port in imports of cattle, general merchandise, timber, flour, grain, coal, etc., and exports, among other things, of steel rails, pig-iron, and iron ore. The rise of B. from a fishing vil. to an active industrial centre dates from the discovery in 1840 of haematite ore at Park, near B. The estab. of mines and smelting works soon followed, and the construction of many m. of railway by the Furness Railway

Co. The docks, 4 in number, cover an area of 280 ac. Noteworthy buildings are the tn hall, erected at a cost of £80,000, and the picturesque ruins of Furness Abbey. B. returns one member to Parliament. The residential areas suffered severely from air attack during the Second World War. Pop. 65,370.

Barrow-on-Humber, residential vil. of Lincs, England, with horticult. chemical works. Barrow Haven, with extensive watercress beds, brick and tile works, and small shipbuilding yard, and New Holland, with a ferry steamer service to Hull, combine to form the par. of B. Pop. 3000.

Barrow Strait, Canada, joins Lancaster Sound and Melville Sound. Average breadth 50 m. Discovered by Parry, and named by him after Sir John Barrow (q.v.).

Barrows (O.E. *beorg*, hill or mound) are the grave-mounds of prehistoric or early historic peoples. They are widely distributed, and in their construction and plan vary much according to the period of their erection and regional geological conditions. B. made entirely of stones are called cairns: other local names are *carn*, *carnedd*, *howe*, *lowe*, and *tump*, while the generic name *tumulus* is sometimes reserved to indicate round B. There are between 30,000 and 40,000 B. in England alone. From them the archaeologist derives much material for his study of human development, and the excavation of B., once a mere treasure hunt, has now been developed into a highly scientific proceeding. Long B. are of the Neolithic period, and usually cover inhumed burials; they are higher and wider at one end, and the burial chamber of wood or a turf-covered cavity may cover a communal burial. Certain long B. with tomb chambers of stone are more properly regarded as megaliths (see MEGALITHIC CULTURE). Long B. are especially characteristic of Wessex and Sussex. Round B. belong in the main to the Bronze Age, and include bowl, bell, disk, saucer, ring, and pond types. In the earliest Bronze Age burial is by inhumation, but cremation with the ashes contained in a pottery urn follows in the later stages. The burial is always a single one. Recent excavation has shown that there is often evidence of a complicated funeral ceremony based on seasonal rites and centred round a 'mortuary house' in which the remains were placed. Rom. B. have an unmistakable steep and conical outline, and in SE. Britain usually cover the burials of wealthy merchant traders. They are also found in Belgic Gaul, with which country these traders had commercial relations. The Six Hills at Stevenage and the Bartlow Hills, Ashdon, Essex, are notable Brit. examples; a Rom. barrow excavated at Holborough, Kent, in 1953, contained a folding iron chair. In the Saxon period there are a few large conical B. such as *Taeppa's law* which gives its name to the settlement of Taplow, Bucks, but these B. which covered the remains of important chieftains are less often found than clusters of small grave-mounds, the burial

...e, exemplified in E. Kent. Small round cairns were used locally, as in the Danes Graves, Driffeld, Yorks, during the Early Iron Age, but they are not common elsewhere. A vivid account of the barrow of Hector is given in the *Iliad*, and Herodotus gives a detailed description of the burial mounds of the Scythian chieftains. Among the Vikings it was the custom to place the dead man in his ship over which a barrow was erected; the famous Sutton Hoo ship burial excavated in 1939 was a cenotaph of an E. Anglian king of Saxon times. The end of the O.E. epic poem of *Beowulf* affords a classic literary example of burial rites, including the erection of a barrow over the ashes from the funeral pyre. The bibliography is extremely large, but the standard work for England is L. V. Grinsell's *The Ancient Burial Mounds of England* (1953 ed.), which gives many references to other works.

Barrulet, see under **HERALDRY**, *Ordinaries* (2).

Barry, Sir Charles (1795-1860), architect, b. Westminster. After serving his articles in London, he travelled in Greece, Italy, Egypt, and Palestine. He started practice in London in 1820. His first important work was St Peter's Church at Brighton, 1824-8. Other early work included the City Art Gallery and Athenaeum at Manchester, the Travellers' Club (1829-31) and Reform Club (1837-41) in London, and King Edward VI's Grammar School, Birmingham. In 1836 he won the competition for the new Houses of Parliament, and was knighted for this work in 1852. His later buildings included Dulwich College schools, 1841, Halifax town hall, 1849-52, and sev. very large mansions, notably Trentham Hall, 1838 (demolished 1910); Eynsham Hall, Oxon, 1843; Bridgewater House, Green Park, 1847 (demolished 1941); and Clivedon House, Bucks, 1851. He was elected R.A., 1841. See life by his son, the Rt Rev. A. Barry, 1867.

Barry, Comtesse du, see **DU BARRY**, **MARIE JEANNE BÉOU**.

Barry, David (1580-1629), dramatist, b. London. There is confusion about his name; he was Lord Barry by courtesy, and the abbreviation 'Lo' was oddly expanded into 'Lodowick.' He wrote *Ram-Alley* or *Merrie Trickes*, 1611, a coarse but spirited and humorous play. He is said to have accompanied Raleigh to Guiana in 1617. See C. H. L. Ewen, *Lording Barry, Poet and Pirate*, 1938.

Barry, Elizabeth (1658-1713), actress. She is said to have been the daughter of Edward B., a barrister, and to have been patronised by Lady Davenant. She was introduced to the stage by the Earl of Rochester, making her first appearance in 1673 as Isabella, Queen of Hungary, in the Earl of Orrery's tragedy *Mustapha*. Though she showed no talent whatever on her first appearance, she was later universally considered to be one of the finest actresses of the time, and created over 100 roles. Her life was as immoral as her talent was great.

Barry, James (1741-1806), Irish painter,

b. at Cork, the son of a coasting trader; he showed early promise in art and at 22 went to Dublin. Here he was introduced to Edmund Burke, who brought him to London, and soon sent him to Rome, where he remained 5 years. He returned to England, 1770, where in 1772 he proposed (unsuccessfully) to decorate St Paul's with historical pictures, it being his aim to introduce the 'grand manner' into England. In 1775 he pub., in answer to Du Bos and Winckelmann, an *Inquiry into the Real and Imaginary Obstructions to the Acquisition of the Arts in England*. He painted 6 pictures for the Society of Arts, Adelphi, London. His most famous picture is that of the 'Victors at Olympia.' Canova said that this was sufficient to bring him to England. A.R.A., 1772; R.A., 1773. He was elected prof. of painting at the Royal Academy, but his quarrelsome spirit made him unpopular, and he was expelled (1799).

Barry, Sir John Wolfe Wolfe- (1836-1918), engineer, son of Sir Charles B., b. London; educ. at Trinity College, Glenalmond, and King's College, London. While under Hawkshaw, B. was engaged as resident engineer during construction of bridges over the Thames, and of stations at Charing Cross and Cannon Street. Later he built Blackfriars, Kew, and Tower Bridges; carried out Earl's Court, Ealing, and Fulham extensions of Metropolitan Dist. railway; constructed B. Dock near Cardiff (largest in Great Britain), and other engineering works in various parts. B. visited the Argentine, 1872, and planned a railway from Buenos Aires to Rosario. Consulting engineer on underground railways of Glasgow; 1903-5 royal commissioner of London traffic. Pubs.: *Railway Appliances* (Text-books of Science), 1876; *Lectures on Railways and Locomotives*, 1882; *The Tower Bridge*, 1894. Was consulting engineer to many railway companies. D. 22 Jan. 1918.

Barry, Philip (1896-1949), Amer. playwright, b. Rochester, N.Y., of Irish parentage. Educ. at Yale and Harvard, he started as a dramatist in 1923 with *You and I*, a social comedy. Many of his plays are of the light and witty type, such as *In a Garden*, 1925, *Paris Bound*, 1927, *Holiday*, 1928, *The Animal Kingdom*, 1932, *The Philadelphia Story*, 1939, *Without Love*, 1942, and *Foolish Notion*, 1945. A more serious vein was struck in *John*, 1927, which tells of the life of John the Baptist. Others with a religious or philosophical motif are *Hotel Universe*, 1930, *The Joyous Season*, 1934, *Bright Star*, 1935, and *Here Come the Clowns*, 1938.

Barry, Sir Redmond (1813-80), Australian judge, educ. Trinity College, Dublin; barrister, 1838. In 1839 he went to Sydney, becoming commissioner of court of requests in Melbourne, 1850. On the formation of the colony of Victoria, B. was solicitor-general; judge, 1851; first chancellor of Melbourne Univ., 1855; knighted, 1860. He founded Melbourne Public Library and National Gallery.

Barry, Spranger (1719-77), Irish actor, b. Dublin; son of a silversmith. He mismanaged his father's business so badly that he became bankrupt, and adopted the profession of an actor. His first appearance was made at the Theatre Royal, Dublin, on 15 Feb. 1744. He played for a time under Garrick, but in 1749 left Drury Lane for Covent Garden, and both houses played *Romeo and Juliet* in rivalry of each other simultaneously. B.'s performance of *Romeo* was considered by many to surpass that of Garrick. B. crossed to Ireland after a time, and opened theatres in Dublin and Cork, but returned to work with Garrick in 1767. He again went to Covent Garden, however, in 1774, where he played till his death.

Barry: 1. Is. in Bristol Channel, part of Glamorgan, Wales.

2. Seaport of Glamorganshire, S. Wales, 7 m. SW. of Cardiff, opposite B. Is. It has a tidal basin of 90 ac. between the mainland and the is., and large docks (114 ac.), opened in 1889, which accommodate the largest vessels. Within the bor. are the church of St Cadoc at Cadoc-ton and the remains of B. Castle (15th cent.); at B. Is. are the remains of St Baruch's church. B. Dock is an important coal-exporting port. Pop. 42,000.

3. Par. of Angus co., Scotland, 7½ m. SW. by W. of Arbroath, and including approximately half the tn of Carnoustie (q.v.). The golf-links were acquired by the gov. in 1892 for military manoeuvres. Pop. 6000.

Barry, heraldic term applied to a shield divided by horizontal lines into 6 equal portions of alternate tinctures. If the number of partitions (which must always be an even number) is more than 6, the shield is described as *Barry of eight, ten*, etc. If the lines are undulating, the shield is said to be *Barry wavy*.

Barry Cornwall, see PROCTER.

Barry Railway Viaduct, across Taff R., Glamorganshire, Wales, spans 2 other railway lines and a canal. Length 1420 ft, height 112 ft.

Barrymore, John (1882-1942), Amer. actor, of a distinguished theatrical family, his real name being Blythe. He first appeared in Chicago, in *Magda*, 1903, and 2 years later made an appearance in London in *The Dictator*. He scored a success as Hamlet, in U.S.A., in 1923, and in London in 1925. He also acted for the films, a notable success being his performance in the double role in the film of Stevenson's *Dr Jekyll and Mr Hyde*. In talking films his best parts were in *Arène Lupin*, *Moby Dick*, *Romeo and Juliet*, and *Svengali*. His autobiography *Confessions of an Actor* was pub. in 1926. See also biography by Alma P. Waters, 1942. His brother and sister, Lionel and Ethel Barrymore, also became leading Amer. actors, his sister, in 1928, opening the Ethel Barrymore Theatre in New York.

Bars Khotan, see BARAS KHOTUN.

Barsine: 1. Also called *Statira*, daughter of Darius Codomannus and wife of Alexander the Great. After the death

of Alexander, she was put to death through the instigation of Roxana (q.v.), who feared that B. might give birth to a son, whose claims would clash with those of her own son, Alexander Aegus.

2. Daughter of Artabazus, satrap of Bithynia, and wife of Memnon, a Rhodian. At the fall of Damascus, 335 bc, she fell into the hands of Alexander the Great, and became the mother of his son Heracles. She and her son were afterwards murdered by Polysperchon, at the instigation of Cassandra.

Barstow, Emmuska, see ORCZY.

Bar-sur-Aube, Fr. tn in the dept of Aube, cap. of an arron. A Rom. fortress here was destroyed by the Huns. In the Middle Ages B. had an important trade fair. There are 2 churches partly 12th cent. It has a trade in wine, grain, leather, and wool. Pop. 3900.

Bar-sur-Seine, Fr. tn in the dept of Aube. It was sacked by the Eng. in 1359, and suffered in the 16th-cent. religious wars. Wines and paper are made. Pop. 2100.

Bart, Jean (1650-1702), Fr. naval officer, b. Dunkirk, as a boy served under Adm. de Ruyter. Was in command of a frigate of the Fr. Navy against the Sp. in the Mediterranean Sea. In the war with England he was captured and taken to Plymouth; he escaped, however, and was made a captain by the Fr. king. In 1690 he took command of a 40-gun ship and helped Adm. de Tourville against the combined Eng. and Dutch fleets; he obtained command next year of a squadron that went up the N. Sea and landed on the coast of Scotland, plundering sev. vils.; made an attack on Newcastle after the Fr. defeat at La Hogue. Retired after Peace of Ryswick in 1697.

Bartan-su, or **Bartine**, River, the anct Parthenius (q.v.).

Bartas, Guillaume de Saluste du, see DU BARTAS.

Barter, system of trading by the exchange of one commodity for another, as distinguished from the sale of commodities for money. It is the common method of exchange amongst primitive peoples, and is a phase in the economic hist. of all races. In civilised countries the custom became practically extinct with the estab. of the money currency. In law, B., or exchange, is a contract for the exchange of 2 commodities.

Bartfeld, see BARDEJOV.

Barth, Heinrich (1821-65), Ger. explorer, b. Hamburg. After studying at the univ. of Berlin, he made his first expedition to Africa, visiting Tunis, Tripoli, and travelling down the valley of the Nile. In 1847 he again travelled in Egypt and the Near E. An account of these journeyings was given in his *Wanderungen durch die Küstenländer des Mittelmeeres*, 1849. From 1849 to 1855 he was engaged with the Brit. expedition of exploration in Central Africa. His experiences during these years he described in his *Reisen und Entdeckungen in Nord- und Zentralafrika*, 1849-58 (Eng. trans., new ed., 1890). In 1863 he became

prof. of geography at the univ. of Berlin. His collection of Central African vocabularies (1862-4) is of great value.

Barth, Karl (1886-), Swiss prof. of theology, a native of Basel. The leader and prophet of the New Reformation thought. B. has changed the whole outlook of Protestant theology on the Continent. After holding professorships at Göttingen, Münster, and Bonn, he was forced to retire from the latter univ. in 1935, and settled in his bp. B. stresses the absolute difference between God and man, man's inherent inability to solve his own problems, and his utter dependence on revelation and grace. His prin. writings are as follows: *The Word of God and the Word of Man* (trans.), 1930; *Credo* (trans.), 1936; *The Knowledge of God and Service of God* (trans.), 1938; *The Holy Ghost and the Christian Life* (trans.), 1938. See J. McConachie, *The Significance of Karl Barth*, 1931, and C. Van Til, *New Modernism, theology of Barth*, 1946.

Barth, Ger. fishing port in the dist. of Rostock, on an inlet of the Baltic Sea, 32 m. NW. of Rostock (q.v.). Pop. 14,000.

Barthélemy, Auguste Marseille (1796-1867), Fr. poet, b. Marseilles. After completing his education at the Jesuit College of Jully, he went to Paris in 1822, where he wrote a series of brilliant satires against the Bourbons. In 1826 was pub. his mock-heroic poem, *Le Villéladre*, written in collaboration with his friend Méry. This was an enormous success, as was also his *Napoléon en Égypte*, 1828. The imperialistic sentiments of *Le Fils de l'homme*, 1829, brought about his imprisonment, from which he was released by the 1830 revolution. This event he celebrated, with Méry, in *L'Insurrection*, 1830. From 1832 his popularity declined, owing to his support of gov. measures distasteful to the Liberal party. His changes of front he attempted to justify in his phrase, 'L'homme absurde est celui qui ne change jamais.'

Barthélemy, Jean Jacques (1716-95), Fr. writer and antiquarian, b. Cassis, Provence. He devoted himself to the study of Greek and oriental languages, and antiquities, especially numismatics. In 1745 he became an assistant in the royal cabinet of medals, and in 1753 was appointed its director. He was deprived of office in 1780. Later, Paré, the *pro tempore* minister of the interior, offered him the place of chief librarian of the Royal, now National, Library, which he refused on account of his age. His best-known work is the *Voyage du jeune Anacharsis en Grèce* (4 vols.), 1788, which has been trans. into many languages, the Eng. ed. being ed. by W. Beaumont (5th ed., 6 vols.), 1817.

Barthélemy Saint-Hilaire, Jules (1805-1895), Fr. politician and scholar, friend and literary executor of Thiers, b. Paris. After occupying a minor position in the ministry of finance, he became in 1838 prof. of Gk and Rom. philosophy at the Collège de France. In 1848 he became a

republican deputy, and was imprisoned for a short time after the *coup d'état* of 1851. After his release he resigned his professorship and devoted himself to oriental studies. As a member of the Bordeaux Assembly, to which he was elected in 1871, he supported Thiers, and for some time acted as his secretary. In Ferry's Cabinet of 1880-1 he was foreign minister, being chiefly responsible for the annexation of Tunis by the French. His chief work is his trans. of Aristotle (1839-44). He also made a verse trans. of the *Iliad*.

Barthez, Paul Joseph (1734-1806), Fr. physician, b. Montpellier. Here he studied medicine and obtained his doctor's degree at the early age of 19. In 1756 he was employed as a physician to the army, but soon returned to Paris to edit in part the *Journal des savants* and the *Encyclopédie méthodique*. In 1769 he was appointed prof. at Montpellier, and became chancellor of the univ. in 1785. His chief work, *Nouveaux Éléments de la Science de l'homme*, 1778, expounds his doctrine of vitalism. Amongst his other works are: *Oratio de Principio Vitali Hominis*, 1773; *Nova Doctrina de Functionibus Corporis Humani*, 1774; *Nouvelle Mécanique des mouvements de l'homme et des animaux*, 1798; *Traitément des maladies gouteuses*, 1802. Appointed physician to Napoleon, 1802. Died of fever. Pub. posthumously, *Traité du Peau*, 1807, and *Consultations de la médecine*, 1810.

Bartholdi, Frédéric Auguste (1834-1904), sculptor, was b. Colmar, Alsace, his father being of It. descent. His famous work is the Liberty statue ('Liberty enlightening the World') on Bedloe's Is., New York, commissioned by the Fr. Gov. and presented to the Amer. nation to commemorate the centenary of its independence. This huge figure, 220 ft high, was unveiled in 1886. Among B.'s other well-known works are the Lafayette statue, New York, 'The Lion of Belfort,' the monument to Vercingetorix, the Gaulish leader, and 'Grief.'

Bartholin, Thomas (Bartholinus) (1616-1680), Dan. physician, son of Kaspar. He visited the most celebrated schools of Europe. In 1637 he went to Leyden, where he republished his father's *Institutiones Anatomicae*, with additions, in 1641. He also visited Paris, Montpellier, Padua, Malta, and Basel, where he took the degree of doctor of medicine. In 1647 he was appointed prof. of philology in the univ. of Copenhagen, which in 1648 he exchanged for the chair of anatomy, which he held till 1661. In 1670 he was appointed physician to the king, and became librarian for the univ.; afterwards in 1675, the king appointed him a member of the grand council of Denmark. He discovered the thoracic duct, a discovery also claimed by J. Pecquet, and pub. numerous medical works, including a study of diseases mentioned in the Bible (1672) and a dissertation on medical poets (1669).

Bartholin, or Bartholine, Thomas (1659-1690), Dan. jurist, son of Thomas B.

Studied at the univs. of Copenhagen, Leyden, Paris, Leipzig, and Oxford. Appointed prof. of hist. and civil law at Copenhagen, and held the offices of assessor of the consistory, secretary to the king, antiquary and keeper of the royal archives. His chief work is *Antiquitatum Dantiscarum Libri Tres*, 1689.

Bartholinus, Kaspar (1585-1629), Dan. scholar, b. Malmö, Sweden. He became prof. of rhetoric in the univ. of Copenhagen in 1611, of medicine in 1615, and of theology in 1624. His text-book, *Institutiones Anatomicae*, 1611, was trans. into English, French, and German, and was used throughout Europe during the 17th cent.

Bartholomé, Paul Albert (1848-1928), Fr. painter and sculptor, b. Thiverval, Seine-et-Oise. He studied in Geneva and later entered the studio of Léon Gérôme in Paris; exhibited *genre* pictures at the Salon from 1879 to 1886, his best being 'Souper de vieillards,' 1808, 'Les Derniers Epis,' and 'L'Alcôve coupant du pain pour ses petits enfants.' From 1891 he exhibited sculptures at the Salon. 'Aux morts,' 1899, now placed in the Père Lachaise cemetery, is one of his finest pieces of sculpture. Largely self-taught, B. followed the classical and not the impressionist school. Among his later pieces may be mentioned 'Paris, 1914-18,' and a memorial to J. J. Rousseau in the Panthéon. He designed the Croix de Guerre and was elected president of the Société Nationale des Beaux-arts.

Bartholomew, St., one of the 12 apostles, commonly identified with Nathaniel, was b. Cana in Galilee, and introduced to Jesus by Philip. After the Crucifixion he is stated by various untrustworthy authorities to have preached in India, Armenia, and Asia Minor. According to tradition he was flayed alive and crucified at Albanopolis in Armenia, or Urbanopolis in Cilicia. His feast is on 24 Aug.

Bartholomew, Edward Sheffield (1825-1888), Amer. sculptor. He was b. Connecticut, and became, in succession, a dentist, painter, and sculptor. He was director of the Wadsworth Gallery at Hartford, where there is a large collection of his works. He studied art in New York, and then lived in Italy till his death, at Naples. His best-known statues are 'Youth and Age,' 'Sappho,' 'Ganymede and the Eagle,' and 'Eve Repentant.'

Bartholomew, Massacre of St., name given to the massacre of Huguenots which began in Paris on St B.'s Day, 24 Aug. 1572, and spread through the provs. during the succeeding weeks. The total number of those killed has been estimated at figures varying from 5000 to 70,000 (probably the figure of 25,000 is roughly correct). In Paris alone 1100 d. The outrage almost certainly owed its origin to the tortuous personal designs of Catherine de' Medici, who, as regent for her son Charles IX., after provoking the 8 years' conflict between the Catholics under the Duke of Guise and the Protestants under the Prince of Condé, during which both leaders lost their lives, lured

the Huguenots into a sense of security by marrying her daughter Margaret to the Protestant Henry of Navarre (afterwards Henry IV.). She then so worked upon the king's feelings as to convince him that Coligny (q.v.), the Huguenot leader, of whose influence over her son she and the Guises were acutely jealous, had designs upon his life, and in a fit of passion he gave orders that Coligny should be killed. His death was the signal for an orgy of slaughter which was probably quite contrary to Catherine's original intention. The Pope commemorated the event by striking a special medal, but it is now generally acknowledged by historians that the massacre was fundamentally political in origin and motives, and that the Holy See had no part in its planning. The majority of modern historians deny that the massacre was premeditated.

Bartholomew Anglicus, Eng. Franciscan, author of *De Proprietatibus Rerum*, c. 1250.

Bartholomew Fair was held annually in W. Smithfield, London, from c. 1123 until 1840 on St Bartholomew's Day, 24 Aug., old style. The right to hold the fair was part of the grant by Henry I to Rahere (*see succeeding articles*) for the foundation of a hospital and priory. It was at one time the chief cloth fair in the country, and an important market for cattle, pewter, and leather. A great and very popular feature was the large number of exhibitions, shows, performers of all kinds, quack doctors, etc. Inevitably the fair became boisterous and licentious, and at various times unavailing efforts were made to stop it. After 1840 the exhibitions were held at Islington. It was proclaimed by the lord mayor for the last time in 1850 and abolished as a nuisance in 1855. *See* Henry Morley, *Memoirs of Bartholomew Fair*, 1859.

Bartholomew the Great, St, Smithfield, London, relic of the priory of Augustinian canons founded by Rahere in 1123. He began building the priory soon after the hospital, and at his death (1144) the remarkable Norman apsidal choir was nearly complete. The church was not fully completed until the early 13th cent. At the Dissolution most of the priory buildings were pulled down; the choir was reserved for parish use, and the rest of the buildings were sold. The site of the original nave has for long been the churchyard, and the present entrance to the church, a 13th-cent. doorway over which a timber-framed building was erected c. 1595, was the entrance to the S. aisle. The tower was built in the early 17th cent. Later the church itself was put to entirely secular uses. Since 1863 much restoration has been carried out and surviving buildings recovered from private hands. The tomb of Rahere in the sanctuary has a very old effigy (possibly 13th cent.) surmounted by an early 16th-cent. canopy. Wm. Hogarth was baptised (1697) in the 15th cent. font.

Bartholomew's Hospital, St ('Bart's'), Smithfield, London, was founded in 1123 by Rahere, a courtier under Wm. Rufus and Henry I. Whilst on pilgrimage to

Rome he contracted malaria, and vowed that if he survived he would found a hospital, and through the agency of Richard de Belmeis, Bishop of London, he received a grant of land in Smithfield from Henry I. Rahere himself was the first master of the hospital, but retired in 1137 to devote himself to the priory. Both priory and hospital were dissolved in 1539, but Henry VIII refounded the latter in 1547. It was rebuilt in 1730-1766, and there have been considerable later additions. It became a great voluntary teaching hospital. Among the profs. of the medical school have been Harvey, Richard Owen, and Abernethy. There are at present over 700 beds; attached to the hospital is a convalescent home at Swanley, Kent. The hospital has some paintings by Kneller, Hogarth, Reynolds, Lawrence, and Millais. The church of St. B. the Less, within the grounds, was rebuilt in 1789 on the site of the original church, and again rebuilt in 1823. See also BARTHOLOMEW THE GREAT, St.

Barthou, Jean Louis Firmin (1862-1934), Fr. statesman, b. Oloron-Sainte-Marie, Basses-Pyrénées. After practising law, he entered politics in 1889, being appointed deputy for the dept. of Basses-Pyrénées. From 1894 he held a succession of ministerial posts until he became premier in Mar. 1913. His gov. lasted until Dec. of the same year, and B. later served as minister without portfolio in Poincaré's gov. during the First World War. After the war he was a protagonist of the policy to maintain vigorously all Fr. claims and guarantees as recognised in the peace treaties. From 1922 to 1926 he was president of the reparations commission, and then became minister of justice in Poincaré's gov. of 1926. He later served under Briand, and was foreign minister in 1934 when, on 9 Oct. he was assassinated at Marseilles with King Alexander I of Yugoslavia, who was also murdered. B. was the author of sev. books, including *L'Action syndicale*, 1904, *Mirabeau*, 1913, and *Lamartine Orateur*, 1919. He became a member of the Academy in 1919.

Bartine, River, see PARTHENIUS.

Bartizan, in architecture, a small, overhanging turret, projecting from the angle at the top of a tower or from a parapet of a building; more commonly seen on castles on the Continent than in the U.K.

Bartlesville, city of Washington co., NE. Oklahoma, U.S.A., trade and distribution centre for an agric. and oil-producing area. It has oil refining and zinc smelting and manufs. seismographs, ventilators, sulphuric acid, metal products, and leather. It is the seat of B. Junior College, and has a U.S. Bureau of Mines experiment station. Near by are the Hulah Dam and a state park. Pop. 19,225.

Bartlett, John (1820-1905), Amer. compiler, b. Plymouth, Massachusetts. In 1849 he became owner of the univ. book store at Cambridge. His knowledge of books was so wide and he was so often

asked for the source of quotations that he began a collection which developed into his well-known *Familiar Quotations*, 1855, now in its centenary ed. In 1894 he followed this with his complete and authoritative *Concordance to Shakespeare*. He was an honorary A.M. of Harvard.

Bartlett, John Russell (1805-86), Amer. author and antiquarian. He was appointed on the commission to determine the boundary line between the U.S. and Mexico (1850-3); and was secretary of state for Rhode Is. from 1855 to 1872. He wrote *The Progress of Ethnology*, 1847, *A Dictionary of Americanisms*, 1848, *Literature of the Rebellion*, 1866, and *Primeval Man*, 1868. His bibliographical works include *An Index to the Acts of the General Assembly of Rhode Island, 1758-1862*, 1863.

Bartlett, Paul Wayland (1865-1925), Amer. sculptor, b. New Haven; educ. there and at Boston. He began sculpture under Frémiet, and at the age of 14 exhibited at the Salon. In 1880 he entered the École des Beaux-arts, and he represented the U.S.A. on the international jury of awards for sculpture at the Paris Exposition of 1900. A chevalier of the Legion of Honour, 1895, he became an officer, 1908, and a commander, 1925. Among his most noted works are statues of Michelangelo, Columbus, and Benjamin Franklin, and one of Lafayette in the square of the Louvre; the pediment over the House wing of the Capitol at Washington; and 6 figures in front of the N.Y. public library.

Bartlett, Vernon (1894-), journalist, b. Westbury, Wilts, educ. Blundell's School, Tiverton. He was successively on the staff of the *Daily Mail*, Reuters, and *The Times*, being foreign correspondent for the latter in Germany, Poland, and Italy, 1919-22. He joined the staff of the *News Chronicle* in 1934, and from 1938-50 was Independent M.P. for Bridgwater. He is a noted commentator and broadcaster on international affairs. Pubs. include *Behind the Scenes of the Peace Conference*, 1919, *Nazi Germany Explained*, 1935, *This is My Life*, 1938, *Struggle for Africa*, 1953, and *Report from Malaya*, 1954.

Bartlett, William Henry (1809-54), artist, b. London. He was apprenticed, as an architect, to John Britton. His sketches were almost entirely topographical. He provided the illustrations to Britton's *Cathedral Antiquities of England*, 1814-35; and illustrated *American Scenery* 1840; and *Canadian Scenery*, 1842, by N. P. Willis, after having travelled extensively in N. America. He wrote sev. works on Palestine and Egypt.

Bartók, Béla (1881-1945), Hungarian composer and pianist, b. Nagyszentmiklós. He first learnt music from his mother, a schoolmistress who became a widow when he was 8. They moved from place to place until 1894, when they settled at Pozsony (Pressburg, now Bratislava), where he studied with L. Erkel. In 1899, by which time he had already played the piano in public, he entered for Budapest Academy of Music

as a pupil of Thomán for piano and Koessler for composition. In 1901 he won the Liszt scholarship. His student works were influenced in turn by Liszt, Brahms, and Wagner, and in 1902 he came under the spell of Richard Strauss for a short time; but later he repudiated all his early works, the first he acknowledged, and labelled Op. 1, being the Rhapsody for piano and orchestra of 1904. About 1905 he began to realise that what had so far passed as Hungarian folk music and been used as such by composers like Liszt, was really Gipsy music, and that the true Magyar peasant music was quite different. He began to collect and publish folk-songs with Kodály (q.v.). In 1907 he became piano prof. at the Academy. His success as a composer was retarded by the often uncompromising harshness of his first mature works; but in 1917 his ballet *The Wooden Prince* and in 1918 his opera *Bluebeard's Castle* were produced. Soon afterwards the political changes in Hungary brought him new difficulties; yet his importance was recognised by 1923, when he was commissioned to write an orchestral work for the 50th anniversary of the union of Buda and Pest, when he produced the *Dance Suite*. In 1927 he toured the U.S.A. and in 1929 Russia. Meanwhile his interest in folk music had extended to Rumanian and Arab music, and in 1934, when he resigned from the Academy, he was engaged by the Hungarian Academy of Arts and Sciences to prepare folk-song collections for official pub. The events of the Second World War made life in Hungary politically intolerable to B. and in 1940 he decided to emigrate to America. But owing to ill-health he found it impossible to obtain profitable employment there, and his pride forbade him to accept money which he did not feel he had earned. He d. in penury in New York on 26 Sept. 1945. His music may be said to fall into 4 periods: a first including the immature early works he discarded; a second in which the influence of earlier composers gradually gives way to that of folk music; a third (including the middle string quartets, the 2nd piano concerto and the *Cantata profana*), where experimentation becomes often ruthless and disconcerting; and a fourth showing a beautiful clarification of style, without any sacrifice of individuality and enterprise, in such works as the 3rd Concerto, the Sonata for 2 pianos and percussion, the *Concerto for Orchestra*, the 6th Quartet and the *Music for Strings, Percussion and Celesta*.

Bartoli, Adolfo (1833-94), It. author, b. at Fivizzano. He was associated in the editorial management of *Archivio storico Italiano*, 1856-9; and prof. of literary hist. in the Instituto di Studi Superiori of Florence, 1874-94. He pub. eds. of old It. texts and catalogues of MSS., as well as a critical hist. of It. literature down to the 14th cent., *Storia della Letteratura Italiana* (8 vols.), 1878-89.

Bartoli, Daniello (1608-85), It. Jesuit, b. Ferrara, and d. at Rome. He entered the order of the Jesuits at the age of 15.

He was commissioned by the father-general to write a hist. of the order, and it is for his *Istoria della Compagnia di Gesù* that B. is chiefly remembered. He was appointed rector of the Gregorian or Rom. College in 1671. A complete ed. of his numerous works, mainly moral, scientific, and linguistic, appeared at Turin in 34 vols. (1823-44).

Bartoli, Pietro Santi (1635-1700), It. painter and engraver, b. Perugia. As an engraver he obtained a great reputation, more, however, from the subjects and the number of his prints than for any particular excellence of execution. He studied painting under P. Le Maire and under Nicolas Poussin (q.v.), whose works he copied closely.

Bartoli, Taddeo, or Taddeo di Bartolo (c. 1363-c. 1436), It. painter, b. Siena. He was one of the greatest of artists in the period which preceded the Renaissance, and his chief care was expended on frescoes. Some of his best work, dating from 1414, is to be found in the municipal palace of Siena, and in the cathedrals of Pisa, Perugia, and Genoa. His favourite subject was the life of the Virgin, and one of his earliest works, 'The Virgin among the Saints,' 1390, is in the Louvre. His nephew, Domenico Bartoli, was his pupil.

Bartolini, Lorenzo (1777-1850), It. sculptor, b. Vorno, near Florence. After acquiring considerable reputation as a modeller in alabaster, he went to Paris in 1797, where he studied painting under Desmarests and sculpture under Lemot. His bas-relief of 'Cleobis and Biton,' 1803, gained the second prize of the Academy. After the fall of Napoleon, who had been his great patron, he retired to Florence, where he d. Amongst his best works are: 'Charity,' 'Pyrrhus hurling Astyanax from the Walls of Troy,' 'Hercules and Lichas,' and 'Faith in God.'

Bartolommeo di Pagnolo del Fattorino, Fra (1475-1517), also known as *Beccolo della Porta*. Florentine painter, b. Savignano, near Florence, by the gate of San Piero Gattolino, hence his name 'della Porta.' He entered the studio of Cosimo Rosselli (q.v.), where he came into contact with Piero di Cosimo and Albertinelli. He became a follower of Savonarola, and on the reformer's death renounced his profession, and in 1500 joined the Dominicans at San Marco. However, he continued to paint in his convent, and about 1504 painted the picture in the Florentine Academy, 'Apparition of the Virgin to Saint Bernard.' In 1506 Raphael on a visit to Florence made the acquaintance of B., and the 2 artists influenced each other's work. B. also learnt much from Leonardo da Vinci, and later from Michelangelo. He was associated with his friend Albertinelli in many of his pictures; the fresco of the 'Last Judgment' (Santa Maria Nuova), 1498, was finished in the lower part by Albertinelli; and the 'Madonna and Saints' in the Pitti and the 'Assumption' in Berlin are among their joint productions. Some of his finest work is at Lucca, including the beautiful 'Madonna della Misericordia.'

1515; of his other well-known pictures, only a few can be mentioned: the 'Marriage of Saint Catherine' (in the Louvre), 'Saint Mark' (Pitti), and 'Saint Sebastian.' B. excelled particularly in draperies and in symmetry of composition. He is said to have been the first to use the lay figure. Consult the biographies of Leader Scott, 1880, and Gruyer (Paris, 1886), and Vasari's *Lives*.

Bartolozzi, Francesco (1725-1815), It. engraver, was a native of Florence. He was originally intended for his father's profession of silversmith, but his artistic bent led to his being instructed in painting. He studied engraving at Venice under Joseph Wagner. For a short time he lived in Rome, where he engraved a fine set of plates from the life of St. Nilus. In 1764 he settled in England under the patronage of George III. He was one of the original members of the Royal Academy, and executed for them, from Cipriani's (q.v.) design, the diploma which is still used. In 1802, at the invitation of the prince regent of Portugal, he became superintendent of an engraving school at Lisbon, where he *d.* B. was famous as head of the school of stipple-engravers in England. He worked mainly after Cipriani and Angelica Kauffman, Sir Joshua Reynolds also, though 'Clytie' after Annibale Carracci has been considered his best work. The famous actress, Mme Vestris, was his granddaughter, *nee* Lucia Elizabeth Bartolozzi. See Tuer's *Bartolozzi and his Works* (2nd ed.), 1885, and Baily's *Francesco Bartolozzi*, 1907.

Bartolozzi, Lucia Elizabeth, see VESTRIS.
Bartolus (1314-57), It. jurist, *b.* Sassoferrato. Studied civil law at Bologna and Perugia; he was a doctor of civil law at the former, and a prof. at the latter, univ. He had a rare knowledge of the jurisprudence of the imperial period of auct. Rome and his commentaries on Justinian's *Digest* are authoritative. He also wrote treatises on evidence and procedure.

Barton, Andrew, Scottish naval commander and the hero of a popular ballad, was killed in a fight with 2 Eng. ships in 1511. Many of his operations savoured of piracy.

Barton, Benjamin Smith (1766-1815), Amer. naturalist and doctor, *b.* at Lancaster, Pennsylvania. He studied medicine and the natural sciences in Philadelphia, Edinburgh, and London from 1782 to 1788, and graduated at Göttingen. On his return to America he practised in Philadelphia, and in 1790 became prof. of natural hist. and botany in the college there; the earliest teacher of natural science in N. America. In 1802 he was elected vice-president of the Amer. Philosophical Society, and in 1809 president of the Philadelphia Medical Society. His works include *Elements of Botany*, 1812-14, *Collections for an Essay toward a Materia Medica of the United States* (3rd ed.), 1810, and *Flora Virginica*, 1812.

Barton, Bernard (1784-1849), commonly known as the Quaker poet, *b.* Carlisle. For the greater part of his

life he was a bank clerk at Woodbridge in Suffolk. He was the author of sev. vols. of mediocre verse, but is chiefly known for his friendship with Charles Lamb. See his *Poems and Letters*, 1849 (new ed., 1853), with a memoir by his son-in-law Edward Fitzgerald (q.v.).

Barton, Clara (1821-1912), Amer. philanthropist, *b.* Oxford, Massachusetts. During the Amer. Civil War she did relief work on battlefields and organised at her own expense the search for missing men. In the Franco-Ger. War of 1870 she associated herself with the International Red Cross of Geneva, after which she represented the U.S.A. at many international conferences, and did personal field work in Cuba in 1898 and in the Anglo-Boer War of 1899-1902. She *d.* at Washington, D.C. Her publs. include a *History of the Red Cross*, 1882, *The Red Cross in Peace and War*, 1898, *A Story of the Red Cross*, 1904, and *Story of My Childhood*, 1907. See C. Bacon-Foster, *Clara Barton, Humanitarian*, 1918.

Barton, Sir Edmund (1849-1920), Australian statesman. He was *b.* Glebe, near Sydney, New South Wales; called to the Bar in 1871. He was a leading figure in the legislative council and assembly, and Speaker, 1883-7; attorney-general, 1889-1891. He became leader of the Federation movement on the retirement of Sir Henry Parker in 1891, and founded (July 1893) the Sydney Federation League. A conference of Australian premiers at Hobart in Feb. 1895 resulted. The Federal Convention at Adelaide, 1897, appointed B. leader. In 1900 he was in England to watch the passage of the Commonwealth Bill through the Imperial Parliament; and he was first Commonwealth Prime Minister, 1901-3. In 1903 he retired and became senior puisne judge of the Federal High Court. He *d.* at Mellow, Blue Mountains, N.S.W., 6 Jan. 1920. See J. Reynolds, *Edmund Barton*, 1948.

Barton, Elizabeth (c. 1506-1534), commonly called the nun, or holy maid, of Kent. She worked at an inn in Aldington. After a severe illness in 1525 she became subject to hysterical ravings and fell into a state of religious mania. Archbishop Warham sent 2 monks to examine her, and one of these, Edward Bocking, was quick to see that she might be used for countering the growing trend in favour of Protestantism and separation from Rome. In 1527 she became a nun at the priory of St Sepulchre at Canterbury. In 1532 she opposed Henry VIII's intention to divorce Catherine and predicted his death within 7 months of his marriage with Anne Boleyn. The non-

ever said was feigned of my own imagination only, to satisfy the minds of those which resorted to me and to obtain worldly praise.' In 1534 she was executed at Tyburn, with Bocking and other accomplices, on a charge of high treason.

Barton, William Eleazar (1861-1930), Amer. theologian and clergyman, *b.*

Illinois. Associate editor of the *Bibliotheca Sacra*, and, later, of the *Congregationalist*. Lectured on applied practical theology and eccles. law. Among his works are *Life in the Hills of Kentucky*, 1889, *The Old World in the New Century*, 1902, *The History and Religion of the Samaritans*, 1906, *The Law of Congregational Usage*, 1915, *Congregational Creeds and Covenants*, 1917, *Saved and Kept*, 1921, and *My Faith in Immortality*, 1926.

Barton Clay, geological name of a group of Eocene (q.v.) beds exposed in S. England, called after Barton in Hants. The B. C. contains a variety of marine fossils.

Barton-on-Sea, see LYMINGTON.

Barton-upon-Humber, anct mkt tn on the S. Bank of the R. Humber, Lincs, England, and one of the prin. ports of the Humber at the Norman Conquest. The tower of Old St Peter's church and the W. porch are Saxon, to which is joined a 14th- and 15th-cent. building; St Mary's church dates from the 13th cent. There is considerable trade in corn, and bricks, tiles, ropes, cycles, and fertilisers are manuf. Pop. 6300.

Barton-upon-Irwell, dist. of Lanes, near Manchester, where the aqueduct constructed by Brindley conducts the Bridgewater Canal over the Irwell.

Bartsch, Johann Adam Bernhard von (1757-1821), b. and d. at Vienna; he received his education in the school of engraving at Vienna under Prof. Schmutzer. In 1781 he was appointed keeper of the prints of the royal collection, which led to the pub. of his work *Le Peintre-Graveur* in 21 vols., 8vo, 1803-21, which is a description of the greater part of the works of the prin. engravers of Europe.

Bartsch, Karl Friedrich Adolph Konrad (1832-88), Ger. philologist, b. Sprottau, Silesia. He was prof. of Germanic and Romance philology at Rostock (1858-71), and at Heidelberg (1871-88). He ed. numerous texts of Middle High Ger. and Provencal poetry, and pub. *Untersuchungen über das Nibelungenlied* in 1865, which he trans. into modern German 2 years later. He wrote *Grundriss der Geschichte der prov. Literatur*, 1862, and *Chrestomathie provençale* (6th ed.), 1904, and trans. the poems of Burns (1865) and Dante's *Commedia* (1876), while in 1874 he pub. a vol. of original lyrics.

Bartsch, Paul (1871-), Amer. naturalist, b. Breslau, Silesia; educ. at the State Univ. of Iowa. He was appointed to the staff of the U.S.A. National Museum, Washington, and was assistant curator and later curator of marine invertebrates there. In 1899 he became prof. of zoology in the George Washington Univ. and then lecturer on medical zoology in the Howard Univ. Was Smithsonian representative in the Philippine expedition, 1907-9, and has represented that institution in many other expeditions. In the First World War he supplied a gas detector in chemical warfare. In 1920 he was Smithsonian delegate to the scientific congress at Honolulu. Author of numerous technical papers on biology.

Bartsia, family Scrophulariaceae, genus

of about 6 species of perennial herbs of Europe and N. Africa, of which *B. alpina*, Alpine B., is found in Britain. Red B. is *Odontites verna*, an ann. weed; and Yellow B. is *Parentucella viscosa*, an ann. of Britain.

Baru, fluffy substance obtained from the sago palm *Saguerus saccharifer*, used for stuffing cushions and for caulking boats.

Baruch (Heb. 'blessed'), son of Neriah, the son of Maaseiah, to whom Jeremiah dictated his prophecies, and who read the roll before the princes in the reign of Jehoiakim about 600 BC. During the siege of Jerusalem by Nebuchadnezzar, B. and his master were at first imprisoned, but were afterwards released and allowed to choose their place of residence; they afterwards went into exile in Egypt, c. 588 BC. According to the deuterocanonical book of Baruch (cf. Josephus, *Antiquities* x. ix. 7) B. went from Egypt to Babylon, and in 581 BC returned to Jerusalem bringing the authentic parts of that book with him. See Jeremiah xxxii, xxxvi, xliii, xlv, and li.

Baruch, Bernard Mannes (1870-), Amer. economist, son of Dr Simon Baruch (q.v.). Going into finance B. was for many years a member of the New York Stock Exchange, and accumulated a large fortune. When the entry of the U.S.A. into the First World War was imminent, President Wilson made him a member of the advisory commission of the Council of National Defence. He became chairman of the committee on raw materials, minerals, and metals, and also head of the commission in charge of all purchases for the Allies. Wilson in 1918 made B. chairman of the War Industries Board, a body invested with vast power to co-ordinate Amer. industries for war-making purposes. After the armistice he went to Paris with Wilson, who had him nominated a member of the Supreme Economic Council. As such he played a leading part in drafting the economic and reparations sections of the treaty of Versailles. In 1919 he became a member of the Conference for Labour and Capital. During the Second World War he worked from 1943 as personal adviser to James Byrnes, then director of the Office of War Mobilisation. In Mar. 1946 he was nominated by President Truman as the Amer. member of the commission of 12 who formed the U.N. commission on atomic energy. B. is a lifelong friend of Sir Winston Churchill, and the author of *Making of Economic and Reparation Sections of Peace Treaty*, 1920, and pamphlets on agric. and economic subjects.

Baruch, Simon (1840-1921), Amer. physician, b. Posen, educ. at the gymnasium at Posen, and later at the Medical College of Virginia. He practised at Camden, S. Carolina, and later at New York. In 1889 he diagnosed the earliest authenticated case of perforating appendicitis successfully operated on. He was the pioneer of scientific hydrotherapy in U.S.A., and became prof. of that subject at the College of Physicians

and Surgeons, New York. Piloted through the Legislature the bill which secured free public baths to the community, the first, the Rivington Bath, being opened in New York in 1901.

Barwick, John (1612-64), Eng. divine. He graduated at St John's College, Cambridge, in 1635, and became M.A. in 1638. His loyalty to the Royalist cause obliged him to leave Cambridge. In London he worked for the king and communicated the designs of the rebels to Charles I, was charged with high treason and imprisoned in the Tower, 1650-2. At the Restoration, he became dean of Durham, 1660, and dean of St Paul's, 1661.

Barye, Antoine Louis (1796-1875), Fr. sculptor, *b.* Paris. He studied sculpture under Bosio and painting under Gros. He is famous for his marvellous animal studies, which are unique in the hist. of sculpture. Amongst these are the 'Lion Struggling with a Snake,' 'Lion Resting,' 'Theseus and the Minotaur,' 'Lapitha and Centaur,' and 'The Hunt of the Wild Ox.' There are sev. examples of his work in the gardens of the Tuileries. He was also successful with the human figure, as exhibited in his 4 groups, 'War,' 'Peace,' 'Strength,' 'Order.' His drawings and water-colours of animals are outstanding also. He worked largely in bronze. See Ballu, *L'Œuvre de Barye*, 1890.

Baryta, barium monoxide (BaO), earth occurring in the minerals barytes, or heavy spar, and witherite. The original name was barote, but Lavoisier's alteration to B. has been universally adopted. It was at first thought to be an elementary substance, but prolonged investigation led to its being separated into the metal barium (q.v.), and oxygen. B. is formed when barium burns in air, or by heating barium nitrate until no more red fumes are given off. It may also be prepared by heating witherite mixed with charcoal to a white heat. It is a greyish-white solid, with sp. gr. about 5; it melts at 2000° . When heated with air barium peroxide (BaO_2) is formed. B. water is a solution of barium hydroxide in water. It is used as an absorbent for carbon dioxide.

Barytes, Barite, heavy spar, or barium sulphate, mineral, important as chief source of soluble barium compounds, and as a pigment under the name of permanent white. It derives its name from its high sp. gr. (4.5) as compared with other mineral sulphates or other minerals with the same general appearance. It occurs in rhombic crystals of varied forms, and may be artificially produced by acting upon baryta with fuming sulphuric acid. The natural sulphate is commonly found associated with lead and silver ores, and is prepared for use as a paint by being finely ground, usually along with white lead, treated with sulphuric acid to remove iron salts, washed, and dried.

Baryton, also called *Viola di Bordone*, stringed musical instrument resembling in tone the viola da gamba. It was invented in 1700, and has now fallen into disuse. Haydn composed a large number

of works for this instrument, which was played by his patron, Prince Esterházy.

Bas, William, see BASSE.

Bas, or Batz, is. in the Eng. Channel, off the N. coast of the dept of Finistère, France. It is about $2\frac{1}{2}$ m. long and 2 m. broad. The is. has 3 villa., a fine light-house erected on a hill 223 ft above sea level, 2 forts, and a haven, that of Kernoc. The chief occupation is fishing. Pop. 1150.

Basaiti, Marco (active 1496-1530), It. painter, *b.* Friuli, perhaps of Gk origin—his works are mainly signed 'Baxaiti.' He lived chiefly in Venice, where he was the rival of Giovanni Bellini, whom he closely resembles in style. He is noted especially for his colour. There are still sev. of his works in Venice. His masterpiece is the 'Calling of St Peter and St Andrew,' in the Academy of Venice, formerly in the old church of the charterhouse. There is a beautiful 'Descent from the Cross,' by B., in the Gallery of Munich. See J. Crowe and G. Cavalcaselle, *Painting in North Italy*, 1871.

Basal Metabolism, see METABOLISM.

Basalt, igneous rock. The Lat. *basaltis* is derived from an African word meaning a stone containing iron, and many varieties of the rock contain iron in the form of magnetite. Igneous rocks are broadly divided into acid rocks containing a large amount of silica, such as granite; and basic rocks, in which silica as quartz is absent, and a comparatively large amount of iron and magnesia is present. The most abundant member of the latter group is B., which consists chiefly of plagioclase feldspar, augite, and olivine and which has a fine-grained texture due to rapid cooling at or near the earth's surface. Most B.s are lavas ejected from fissures or craters. Seen with the naked eye, they are dark rocks in which the crystalline structure is barely apparent, although some large crystals may be scattered through them. Under the microscope the minerals augite and olivine appear embedded in a crystalline ground mass of plagioclase feldspar, augite, and magnetite. In certain rocks the olivine is frequently altered in part to a fibrous green serpentine. B. rocks are of common occurrence in Iceland, Skye, Mull, Antrim, central France, Germany, Italy, Washington, Idaho, the Deccan, Sandwich Is., etc. They represent lava which has exuded from fissures in the ground, and has spread over a considerable surface. The stresses to which the cooled rocks were subjected resulted in a network of cracks or 'joints' of a roughly hexagonal shape, similar to the cracks produced in dry mud under certain circumstances. Hence many of the basaltic rocks of N. Ireland and W. Scotland exhibit a columnar structure, as in the Giant's Causeway and Fingal's Cave. B. was known to the anc. Egyptians and Romans, who used it for building purposes. The basaltic plateau of Auvergne played a part in the controversy between the 'Vulcanists' and 'Neptunists' of the latter part of the 18th cent. The 'Neptunists,' led by Werner,

held that igneous rocks were produced by chemical precipitation from the ocean which covered the surface of the earth at one time. Desmarest, however, by a careful study of the B. rocks of Auvergne, showed that they were true lavas, not necessarily ejected from cone-and-crater volcanoes, but gradually extruded from fissures in the earth's crust and extending themselves in all directions.

Bascinet, Basinet, or Basnet, light helmet (q.v.), so-called from its resemblance to a basin, with or without a visor, the latter often being acutely pointed in front. The B. was worn throughout the 14th and early years of the 15th cent., and was the helmet of Crécy and Poitiers. *See also* ARMOUR.

Base: 1. In architecture, either (i) the lowest member of a column, on which the shaft rests; or (ii) the lowest course of masonry in a building; or (iii) the lowest stage of panelling in a room. *See* DADO.

2. In heraldry, the lower third of a shield, sometimes marked off from the remainder by a horizontal line. Any figure which is placed in this lower part is said to be in B., and if it does not occupy the central portion it must be distinguished as being in the dexter or sinister B. point.

3. In games, such as baseball and prisoner's B., the station to or from which the player proceeds.

4. In the military art, a secure position where the main supplies and reserve forces are kept, which is connected with the attacking forces by defended lines of communication.

5. In chem., a B. is a substance which can combine with an acid to form a salt and water only. In inorganic chem., B.s are oxides and hydroxides of metals and hence a B. is any substance that produces hydroxyl ions, OH^1 , as the only negative ions in aqueous solution. If a B. is soluble in water, it is also known as an alkali. In organic chem., the most common basic substances are amines, which are the alkyl or aryl derivatives of ammonia. They combine with acids to form organic salts.

6. In geometry, the line or surface upon which a figure or solid stands. In the case of a triangle any one of the angular points may be regarded as its vertex, and the side opposite it is then called the base.

Base Exchange, *see* WATER-SOFTENING.
Base Fee, *see* ESTATE AND FINES AND RECOVERIES.

Base Line, in surveying (q.v.), measured line which forms the side of a triangle, and of which the adjacent angles are also measured, so that the third point of the figure is easily determined. The country to be surveyed being thus mapped out in triangles, the details can be filled in without overlapping. In large surveys many B. L.s are drawn, varying in length from 3 to 10 m. *See* GEODESY.

Base of Operations, term used in warfare for the depot where everything required for the fighting army—munitions, food, transport, tanks, relief troops, etc.—is collected and organised

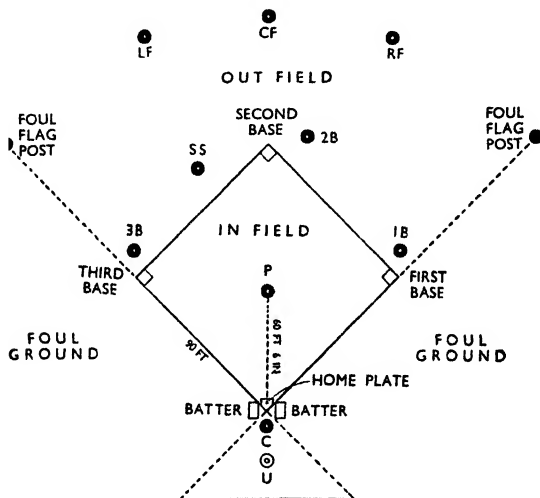
before being sent to the front, and where the wounded can be attended until recovered or transported to their homes. The development of aircraft, however, has made it possible to transport wounded men immeasurably greater distances than in pre-aircraft days. The B. of O. is usually a seaport on the bank of a riv., but in inland warfare may be a railhead, road junction, or group of landing grounds. The essential is that the base should command a line of communications with the source of supply. An army cut off from its B. of O. and a base cut off from its source of supplies are more or less useless; but in modern warfare the development of paratroops and airborne troops and supplies has made it possible to operate within enemy ter. or enemy-occupied ter. regardless of a B. of O. in the old sense; though the forward landing ground or dropping area may be regarded as a base to be made secure; as, for example, in the case of Wingate's famous Chindits in the campaign in Burma in the Second World War. In the Franco-Prussian war of 1870 the Prussian B. of O., for instance, was the chain of fortresses which line the banks of the Rhine; in the S. African war, 1899–1902, the Brit. base was Cape Town; in the First World War the base of the B.E.F. was Boulogne, and of the Armée de l'Orient, Salonika; and in the Second World War Cairo was the base of the Brit. Eighth or Desert Army. Sydney was MacArthur's (q.v.) base. Rome was the allied base in the later stages of the campaign in Italy. *See also* ARMY.

Baseball, national game of the U.S.A. Research has revealed that a game called 'Base Ball' was played in the U.S.A. and England before 1839. It was founded on the old Eng. game of rounders. However, baseball as Americans know it was first played at the Elysian Fields, Hoboken, New Jersey, in June 1846, between the Knickerbockers and the New York Nine. The Cincinnati Red Stockings were the first all-professional team, and in 1869 they played 64 games without a loss. The standard ball of the same size and weight, still the rule, was adopted in 1872. The first catcher's mask was worn in 1875. The National League was organised in 1876. The first chest protector was donned in 1885. The Amer. League became a major league in 1901. Judge Kenesaw Mountain Landis became Commissioner of B., by action of the two major leagues, in 1921, and, upon his death (1944), Albert B. Chandler was elected to that office in 1945. Chandler was succeeded by Ford Frick (1951), the National League president. To-day B. 'fans' (devotees) number millions of all classes.

The World Series B. contests have been held since 1903; they are played between the champions of the National League and the Amer. League. Besides these there are over sixty minor professional leagues and many more amateur ones. The game is played by nine players on each side. The bat is round, and must not exceed 42 in. in length and 20 in. in diameter at the thickest part.

The average weight of bats used in the major leagues is 36 oz. The ball weighs about 5 oz. and is 9 $\frac{1}{4}$ in. in circumference. The ground is in the form of a diamond, 90 ft square. The first B. diamond was laid out in 1839 by Gen. Abner Doubleday, and his demarcation has not since been altered. The rules were standardised in 1887. Bases are placed on each angle, and are known as home, first, second, and third bases. The ball is delivered with great swiftness by the pitcher, who stands in the centre of

caught by one of the fielders before it hits the ground. He is also out if he fails to reach first base before the ball, or is hit by the ball when running between the bases. An innings is over when three men are out, and then the fielding side takes its turn at bat. Nine innings make up a game, unless the score stands at a tie at the ninth innings, in which case the game is continued till one or other of the teams is ahead at the end of the next innings played. The most important defensive player is the pitcher. Pitching is an art, and great



THE BASEBALL DIAMOND

U, umpire; C, catcher; P, pitcher; 1B, first baseman; 2B, second baseman; 3B, third baseman; SS, short stop; LF, left field; CF, centre field; RF, right field.

the diamond, to the batter, who stands at home plate. The pitcher pitches the ball in any manner he chooses, and it must pass over the home plate between the batter's shoulders and knees. If he fails to do so four times the batter is given a 'walk' to first base. The catcher is behind home plate, while the fielders take up positions as first, second, and third basemen, short stop, centre fielder, right fielder, and left fielder. The batter, if he hits the ball, attempts to make the circuit of the bases at the angles of the diamond. If he succeeds he scores a run. He may stop at any base and try to steal on to the next while another player is at bat, but he must always move on to make room for a following base-runner. A batter may be put out by failing to hit the ball after three fair attempts, in which case he is said to be 'out on strikes,' or if he hits the ball and it is

skill is required for the curves, drops, and speed a pitcher must possess. Besides the pitcher's skill, the speed, accuracy, and throwing ability of the fielders are of the utmost importance. However, as the game is now played, the hard-hitting batter is the most valuable man in the team: the whole game revolves around the man who can hit for extra bases. The most outstanding player of modern times was 'Babe' Ruth (q.v.).

BASEBALL STATISTICS (1936-56). *U.S. Championships—National League*: New York Giants (1936-7, 1951); Chicago Cubs (1938, 1945); Cincinnati Reds (1939-40); Brooklyn Dodgers (1941, 1947, 1949, 1952-3, 1955-6); St. Louis Cardinals (1942-4, 1946); Boston Braves (1948); Philadelphia Phillies (1950); Cleveland Indians (1954). *American League*: New York Yankees (1936-9, 1941-3, 1947, 1949-56); Detroit Tigers (1940, 1945);

St Louis Browns (1944); Boston Red Sox (1946); Cleveland Indians (1948). *World Series*: New York Yankees (1936-1939, 1941, 1943, 1947, 1949-54, 1956); Cincinnati Reds (1940); St Louis Cardinals (1942, 1944, 1946); Detroit Tigers (1945); Cleveland Indians (1948); Brooklyn (1955). See D. E. Jesse, *Baseball*, 1938.

Basedow, Johann Bernhard, originally **Johann Berend Basedau** (1723-90), Ger. educational reformer, b. Hamburg and d. Magdeburg. In 1753 he taught at Sorø, in Denmark, and in 1760 in a school at Altona, which he was obliged to leave in the following year because of his heterodoxy. In 1762 Rousseau's *Émile* gained in him a strong admirer, and increased his desire to instruct youth according to nature in all things. In 1774 he pub. his *Elementarwerk*, infused with the theories of Rousseau; it was an illustrated school-book, pub. by contributions from influential and wealthy people. In the same year he opened his Philanthropin at Dessau to carry his theories into practice, but after 10 years he found himself unable to cope with it, owing to his restless and quarrelsome disposition. He then devoted himself to private tutoring, and the Philanthropin was closed 3 years after his death. He is noteworthy as the forerunner of Froebel and Pestalozzi, and his work as a reformer has had great influence on education throughout Europe.

Basel (Fr. *Bâle*): 1. Canton of Switzerland, divided into two half-cantons in 1833 after civil strife between the peasants of the rural part and the citizens of the tn. The latter were worsted, and their share of the canton was limited to the tn and two cooms. **Basel-Stadt** or **Bâle Ville** (area 14 sq. m., pop. (1955) 209,700), has a constitution dating from 1889. The remainder of the canton comprising **Basel-Land** or **Bâle Campagne** has an area of 165 sq. m., mainly agric. land, and a pop. (1955) of 118,800, with constitution dating from 1892. B. joined the Swiss Confederation in 1501.

2. Cap. of the above canton, second largest in of Switzerland, with pop. (1955) 194,700, mainly Protestants, lies on both sides of the Rhine, where France, Germany, and Switzerland meet. It is mentioned as a fort in AD 374 (the name means a royal residence, *Basilia*). The middle classes freed themselves from the dominion of the bishops and nobles and Austrian grand dukes, and in 1501 the tn became a member of the Swiss Confederation. It was one of the literary centres of Europe, and so many books were printed at its presses between 1468 and 1500 that there are 324 in the library of the Brit. Museum. The univ. was founded in 1460 and became famous under Erasmus (q.v.). In 1529 B. accepted the Reformation and became one of its chief centres. The picture gallery contains paintings by Holbein (q.v.), who lived at B. in 1515-26. The univ. library contains 433,000 vols. and 267,000 pamphlets. B. is one of the chief industrial and commercial centres in the country, and is the only Swiss tn having an important inland port. There is weaving of silk ribbon

and a flourishing chemical industry. B. is the site of the Bank for International Settlements estab. in 1930.

Basel, Council of, 17th oecumenical council, met in 1431, Eugenius IV being Pope and Sigismund Emperor of the Holy Rom. Empire. The main purpose of the council was to conciliate the Hussites, but the Pope refused to sanction the movement and ordered the council to be dissolved. This order was disregarded, as was also the order that the council should remove to Italy. The council ratified the right of the general council to exercise authority over the Pope. It concluded a peace with the Hussites, known as the treaty of Prague, 1433. The council was oecumenical up to its twenty-fifth session, and the Pope ratified only those of its decrees which dealt with the eradication of heresy and the peace of Christendom, and only those reforms which did not detract from the rights of the Holy See. In 1438 the council continued at Ferrara, having a brief prospect of union with the Gk Church. The Pope failed to appear and the council then issued a decree suspending him from office. He was formally deposed, and in 1439 Duke Amadeus of Savoy was elected in his place. Eugenius held his position, however, and re-assembled the council at Florence (1439). On his death a compromise was effected whereby the council directed the Church to obey the new Pope Nicholas V. See **COUNCILS, CHURCH**.

Basement, in architecture, either (i) the lowest storey of a building, if wholly or partially below ground level; or (ii) the lowest stage or storey of a classical building, beneath the prin. order of columns or pilasters on the façade. In such cases the B. was sometimes 'rusticated' to create the effect of massive strength.

Basevi, George (1794-1845), architect, b. London, pupil of Sir John Soane (q.v.). Travelled in Italy and Greece, 1816-19. Designed the Fitzwilliam Museum, Cambridge, 1836-45; country mansions at Bretton Park, Gatcombe Park, Taplow, etc.; Gothic churches at Stockport, Twickenham, Chelsea, etc.; and laid out part of Belgravia, London, including Belgrave Square and Pelham Crescent. He was killed by falling from a tower at Ely Cathedral while surveying it.

Bassey, tn of the Philippine Is. It is on the San Pedro Bay, Samar Is. Pop. 35,523.

Bashan is called by the Septuagint *Basan*, by Josephus and Ptolemy *Balanaia*. It belonged to Gilead in the widest sense, but in a stricter sense it was distinguished from and situated to the N. thereof. B. bordered in the N. upon the Syrian dists. Geshuri and Maachathi; in the S. it stopped short of the R. Jabbok. Its W. boundary was the Jordan. The E. limits are undefined.

B. was a kingdom under Amoritic sovereigns who resided in Ashtaroth and in Edrei. Og was the last king of the Amoritic dynasty. In the battle of

Edrei, about the year 1452 BC, the Israelites smote Og, with his sons, and all his people, until there was none left alive, and they possessed his land (Num. xxi. 33). Moses gave B. unto the half tribe of Manasseh, 1451 BC. (Num. xxxii. 33). At the commencement of the Christian era B. belonged to the tetrarchy of Philip, and afterwards to that of Agrippa II.

Bashaw, see PASHA.

Bashi Islands, see BATAN ISLANDS.

Bashibazouks, irregular Turkish troops serving under the sultan and receiving their reward chiefly from plunder. They were chiefly responsible for the Bulgarian atrocities of 1876.

Bashkir Autonomous Republic, in Russia, was formed in 1919. It lies in the S. of the Ural Mountains and the adjacent lowland in the W. traversed by the R. Belaya, a trib. of the Kama. It has rich deposits of oil, iron ore, and non-ferrous metals. Area 55,400 sq. m.; pop. 3,323,000, mostly Russians (since 16th cent.), Bashkirs, and Tatars. There are varied industries (engineering, oil, chemical, metallurgical, textile, food), grain growing, market gardening, cattle, sheep, and horse breeding, and bee-keeping. The prin. tns are Ufa (cap.), Sterlitamak, and Oktyabr'skiy. The area was annexed by Muscovy after the conquest of Kazan. Industrial development dates from the 18th cent. (metallurgy); there has been oil extraction since the 1930's, and engineering since the Second World War.

Bashkirs (own name Bashkort), Turkic-speaking people living in the Bashkir Autonomous Rep. (where they form a quarter of the pop.) and the surrounding areas, and numbering (1939) 843,000. They have been known since the 9th cent., when they were nomads and partly spoke an Ugrian language related to Hungarian. They acknowledged the supremacy of the Volga Bulgarians and the Golden Horde, then of the Kazan, Nogay, and Siberian Khanates, and from 1557 that of Muscovy. Russian colonisation led to sev. Bashkir uprisings in the 17th and 18th cents. A Bashkir nationalist gov. was formed in Orenburg in 1917 but joined the Bolsheviks in 1919 (see R. Pipes, *The Formation of the Soviet Union*, Cambridge, Massachusetts, 1954). Since the 14th cent. they have been Muslims. Now the majority of B. are sedentary collective farm members.

Bashkirtseff, Marie (1860-84), Russian painter and diarist, was b. of wealthy parents at Poltava, Russia. At the age of 13 she instituted a diary which she continued to the time of her death, inscribing in it her joys and sorrows, her enthusiasms and her ambitions, above all her passionate desire for immortal fame. She was endowed with a beautiful voice and considerable literary gifts, but chose painting as her final expression in the arts, and her picture of 'The Meeting,' 1884, was acquired by the Luxembourg. She travelled much, but when only 24 she succumbed to consumption. See Mathilde Blind, *A Study of Marie Bashkirtseff*, 1892; *The Journal of Marie Bashkirtseff*,

trans. by Mathilde Blind (2 vols.), 1890; *The Letters of Marie Bashkirtseff*, trans. by Mary J. Serrano, 1891; Dormer Creston, *Fountains of Youth*, 1936, *Life of Marie Bashkirtseff*, 1943.

Basic English, 'pocket English' with a vocabulary of some 850 words. The first work on 'basic'—or Brit.-Amer.-Scientifico-International-Commercial English—was written by I. A. Richards of Cambridge, and later of Harvard Univ., and the late C. K. Ogden. Its advocates contend that it can give the sense of anything which may be said in English. Actually it was found that 1000 words were needed to put the N.T. into B. E. The use of such a restricted vocabulary naturally demands great ingenuity to express many ideas. In 1943 Mr Winston Churchill persuaded the Cabinet to set up a committee of ministers to report on B. E. and inquire into the possibilities of extending the use of English as an international language—since it is an easier language for foreigners to learn than Esperanto, Volapük, Ido, Novial, and Solresol. A similar idea was under consideration in 1939, when the gov. appointed a committee of the Economic Advisory Committee to examine the methods of teaching simplified English to those who did not speak the language, but the war broke out soon afterwards and the committee never met. B. E. would, no doubt, be of some value in Brit. colonial territories in developing the policy of stimulating educational advance among backward peoples. B. E. has made headway in many countries as a quick method of giving some facility of expression in English. The Local Examinations Syndicate of Cambridge Univ. include texts in B. E. as options in Eng. literature for the Oversea Junior Certificate and they regularly set examination question papers in B. E. on the Basic N.T. In 1947 the Crown purchased the copyright of B. E. for £23,000. See C. K. Ogden, *Basic English and its Uses*, 1943, and *The Basic Dictionary* (for translators), 1932.

Basic Rocks, igneous rocks containing about 45-55 per cent of silica (SiO_2). The basic volcanic rock basalt is one of the most abundant of all igneous rocks. The commonest plutonic basic rock is gabbro. See BASALT; GABBRO; IGNEOUS ROCKS.

Basic Slag, a by-product of steel manuf., consisting chiefly of tetra-calcium phosphate ($Ca_4P_2O_8$), calcium silicate ($CaSiO_3$), calcium oxide (CaO), and ferric oxide (Fe_2O_3), used as a slow-acting phosphatic fertilizer in agriculture and horticulture, especially for legumes and fruits.

Basidiomycetes, large class of fungi, perhaps 13,500 species, which includes mushrooms, toadstools, bracket fungi, smuts, and rusts (q.v.).

Basidu, Basidom, or Bassadore, port at the NW. extremity of Qishm Is. in the Persian Gulf. It was used as a Brit. naval H.Q. in the suppression of piracy (1822-8), but was soon abandoned because of its intolerable climate. In

1935 the Brit. coaling station in B. was transferred to Bahrain.

Basil, or **Basilius**, St (329-79), sur-named the Great; b. Caesarea, studied at Antioch and Constantinople, where Libanius (q.v.) was his fellow student. B. went to Athens and met Gregory of Nazianzus (q.v.), who became his close friend; returned to Cappadocia in 355, and taught rhetoric; travelled in Syria, Egypt, and Libya, visiting the monasteries, and was so pleased that he determined to found a monastery in Pontus. B. and Gregory of Nyssa (q.v.), his brother, and Gregory of Nazianzus are the 3 great Cappadocian Fathers. His rule still governs E. monasticism (see EASTERN ORTHODOX CHURCH). In 370 he succeeded Eusebius as Bishop of Caesarea, but was persecuted by the Emperor Valens for his opposition to Arianism. See E. Leigh-Bennett, *Handbook of the Early Fathers*, 1920; W. K. L. Clarke, *The Ascetic Works of St Basil*, 1925; R. J. Deferrari (trans.), *Letters of St Basil*, 1926; M. G. Murphy, *St Basil and Monasticism*, 1930; G. L. Probst, *St Basil the Great and Apollinaris*, 1956.

Basil, Monks of St. St B., about the year 358, when he retired to Pontus, founded a monastery for himself and his followers, and drew up its regulations, which were soon adopted in other monasteries. This rule gradually spread to all E. monasteries, so that all Orthodox monks are now Basilians. There are Basilian monasteries in the W. in communion with the Holy See, notably in Italy, Lithuania, Ruthenia, Canada, and the U.S.A.

Basil, name applied to sev. species of Labiatae. The sweet B., *Ocimum basilicum*, grows in India and is cultivated as a pot-herb; *Acinos arvensis* is B.-thyme, and *Clinopodium vulgare* Wild B. The B. famed in romance and art is the *Ocimum basilicum*; it is immortalised in Boccaccio's *Decameron*, in Keats's poem, *The Pot of Basil*, and in Holman Hunt's painting of 'Isabella and the Pot of Basil.'

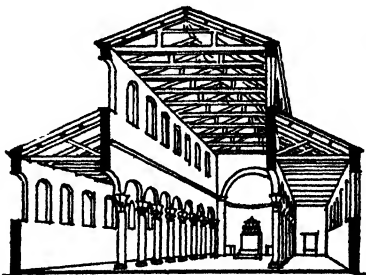
Basilan Island, largest is. on Sulu Archipelago, separated from Mindanao Is. by the strait of Basilan. It produces coconuts, corn, rice, and rubber. There is also fishing. Pop. c. 50,000.

Basildon, urb. dist. of Essex, England, 12 m. SW. of Chelmsford, including Billericay and Wickford. B. is scheduled for development as a new residential tn, with a target pop. of 90,000. Pop. 32,000; (of urb. dist. 51,000).

Basilica (Gk. *basiliké*, a royal building or palace) may be either (i) a public hall used for administering justice and for the transaction of commercial business in a Rom. city, usually adjoining the forum or market-place; or (ii) an early Christian church, somewhat resembling a secular B. in its general plan and arrangements.

The chief Rom. Bs were built in Rome itself, and provided shelter from rain and freedom from disturbance, essential requirements for the orderly conduct of legal and commercial business. The earliest recorded example, the Porcian B., was built in 184 BC, and may have

been inspired by the Stoa at Athens; it no longer survives. The earliest remaining example is at Pompeii, c. 100 BC. In Rome the B. Aemilia, c. 54-34 BC, was soon followed by the B. Julia, 31 BC-AD 14, and the B. Ulpia, AD 113. The B. Nova, begun by Maxentius, was finished by Constantine after AD 313.



SECTIONAL ELEVATION OF A TYPICAL BASILICAN CHURCH OR CHRISTIAN BASILICA

There were Bs in all the chief Rom. prov. cities, including a large one on the site of Gracechurch Street in London; and smaller examples have been excavated at Cirencester and Silchester. The typical Rom. B. (excluding the latest examples) consisted of a long and wide open space, or nave, flanked on either side by aisles, which were separated from the aisles by a range of columns. Above the aisles were often galleries, with flat roofs, and above these again was a range of windows lighting the main interior. The normal Roman B. did not possess an apse, but there was a throne for the judge at the end opposite the entrance. See also CHURCH.

Basilica, Gk code, begun c. AD 876 by the Emperor Basilus I (q.v.), completed by his son Leo VI the philosopher, and pub. in 60 books in 887. It was revised by the order of Constantine VII, about AD 945.

The B. comprised most of the *Corpus Juris Civilis* (q.v.) of Justinian, and the *Imperial Constitutions* made after his time, in 60 books, which are subdivided into titles. The extracts from the *Digest* are placed first under each title, then the constitutions of the Code, and next the extract from the *Institutes* and the *Novellae*. The B. does not contain all that the *Corpus Juris* contains, but it contains some things which are not in the *Corpus Juris*. An ed. of the larger part of the B., by Fabrot, was pub. at Paris in 1647 in 7 vols.

Basilicata (anct. Lucania, q.v.), region (*compartimento*) of S. Italy, comprising the provs. of Potenza and Matera (qq.v.). It is bounded N. by Apulia, W. by Campania and the Tyrrhenian Sea, S. by Calabria, and E. by the Gulf of Taranto (qq.v.). The chief tn is Potenza. Area 3855 sq. m.; pop. 647,000.

Basilicon (Gk *basilikos*, royal), name

sometimes applied to sev. resin ointments, consisting of yellow wax with lard and rosin, or of Burgundy pitch, suet, and turpentine. It is usually known as *ceratum resinae*, or resin ointment.

Basilicon Doron (Gk 'royal gift'), title of a pamphlet written by James VI of Scotland in 1599 for his son, Prince Henry. In it he expounds his theory of the divine right of kings.

Basilides (fl. AD 125), founder of a Gnostic sect, lived in Alexandria under the Emperors Trajan and Hadrian. His doctrines reflected those of Zoroaster, but his tendency towards extremes was discarded by his later followers. He taught the doctrine of emanation, beginning with the emanation of mind from Abraxas, the Supreme Power, down to the creation of 365 worlds by a number of angelic powers. There were 365 emanations, a mystic number constantly occurring in this religion; the name Abraxas itself being a corruption of Abrasax, a Gk word of which the letters are computed to make the number 365.

Basilisk: 1. Name given by the Greeks and Romans to an imaginary creature whose glance could kill, as could its burning, poisonous breath.

2. Genus of tree lizards of the family of Iguanidae, which are perfectly harmless. They are found in central America, where they are considered edible. *Basiliscus mitratus* is the most common species, noted for its scaly helmet.

Basilius I, the Macedonian (c. 812-86), Byzantine emperor; he became a favourite of the Emperor Michael III, who made him his co-ruler. In 867 B. murdered him, and was proclaimed emperor. He ruled wisely, and began to compile the code of laws completed by his son Leo VI (see BASILICA). He fought successful wars against the Saracens, and helped to make the Gk Church more independent of Rome. B. was the founder of the Macedonian dynasty.

Basilius II (c. 958-1025), Byzantine emperor, son of Romanus II, at whose death (963) B. and his brother Constantine became nominal rulers, the actual power being in the hands of Phocas. In 976 the brothers were proclaimed emperors under their guardian Basilius the Eunuch, but from about 986 B. was emperor in fact as well as theory. In 1018 B. inflicted a crushing defeat on the Bulgars. Vladimir, grand duke of the Russians, married B.'s sister and became a Christian in 988. B. was succeeded by his brother Constantine as sole emperor.

Basilosaurus, or Zeuglodon, primitive Eocene Cetacean or whale of giant size. It had an elongated body over 50 ft long.

Basin: 1. Term used in geography to indicate the whole tract of country drained by a certain riv.

2. In geology, term applied to depressions of the strata occasioned by synclinal dips, especially such as are on a large scale. The Tertiary B.s of London, Hants, and Paris rest on Chalk, and the coal basin of S. Wales rests on Old Red Sandstone.

Basing, or **Basingstoke**, John (d. 1252),

Eng. scholar. He is said to have studied at Oxford, Paris, and Athens; he brought home with him sev. Gk MSS., and was promoted by Groseteste to be archdeacon of Leicester.

Basingstoke, mkt tn, parl, and municipal bor. of Hants, England. The remains of the castle destroyed by Cromwell in 1645 may be seen, and traces of Rom. occupation abound. Industries include agric. machinery, motor works, engineering, scientific instruments, clothing, leather, and mineral waters. Pop. 17,000.

Basingwerk, see HOLYWELL.

Baskerville, John (1706-75), Eng. printer, b. Wolverley in Worcs. Having a talent for calligraphy and carving in stone, he kept a writing school in Birmingham. In 1740 he entered the japanning business, making a fortune by improvements in the process. Soon after this he experimented in typesetting, and produced types far superior in distinctness and elegance to those previously employed. He then estab. his own printing-house, publishing a *Virgil* in royal quarto, a *Terence*, *Horace*, etc., all being fine specimens of typography. But as the sale did not justify his hopes, he did not print many works. He was printer to Cambridge Univ. (1758-68). Specimens of the B. press have long been rare.

Basket, vessel of willow rods, rushes, cane, and other like materials, used for the purpose of holding, carrying, and



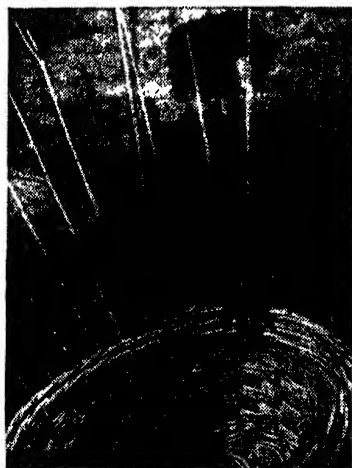
Rural Industries Bureau

EXAMINING WILLOW CROP PRIOR
TO HARVESTING

protecting articles. B.-work was used in ancient times for huts, boats, horse-drawn vehicles, and military equipment. The etymological derivation of the word is obscure, the connection with the Lat.

bascauda being now discredited. The probable derivation of B. from *bascauda* through O.F. *basche* is supported by Wyld (*Universal English Dictionary*, 1932-6).

Willow is the traditional material for basketry in England; its cultivation is mentioned by Pliny in his *Historia Naturalis*. The growing of willows as a crop is, however, recent, dating only from 1800. The species grown and used for basketry are *Salix triandra*, *S. viminalis*, and *S. purpurea*. There are many



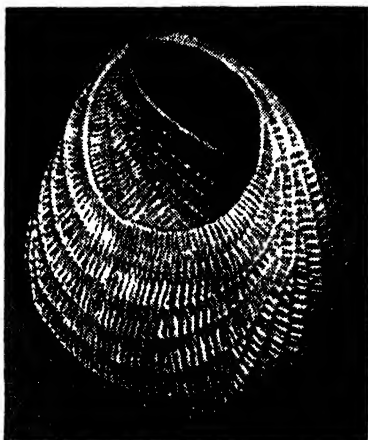
Rural Industries Bureau
COMPLETING THE BORDER ON
A WASHING BASKET

varieties of each species. The most important is *S. triandra*, black maul, which produces high quality rods much favoured by the B.-makers. They are propagated by cuttings and, when estab., a willow bed will produce a crop of rods annually for from 20 to 50 years, depending on local conditions. They require fertile lowland sites and deep, well-drained soil. The willow-growing and B.-making industry reached its peak in the 19th cent., and although now, for many reasons, including foreign competition, considerably reduced in extent, it is enjoying renewed prosperity. The area of Eng. willow beds is now estimated to be 2000 ac., of which over half is situated in an area 7 m. by 9 m. with the centre at Langport, Somerset, the remainder being situated mostly in the Midlands and E. Anglia. B. ware is entirely hand-made. A willow stripping machine was introduced from France in 1937; willow husbandry has been mechanised to some extent in recent years.

The weaving of wicker-work is one of the oldest known crafts, probably

practised by Neolithic man. In England wicker-work fragments were found at the site of the Glastonbury lake vil. of c. 100 BC. The earliest known B.-maker, Johanne Hoc, was subject to the Suffolk poll tax in 1381. The Basket Makers' Co., estab. in 1569, was granted a royal charter in 1937. Nevertheless it is certain that B.-makers practised their craft in the City of London prior to the estab. of the company; they were included in a crafts list of the Brewers' Co. dated 1422. Documents of churches in the Eastcheap neighbourhood where they lived, dated from 1479, record gifts by B.-makers and their wives.

The industry has suffered from the effects of cheap imported B. ware and latterly from the use of substitute materials. London apprentices complained of imports from Holland in the reign of Henry VIII. In more recent times wooden boxes have largely replaced B.s for horticult. and agric. produce. To-day the Brit. industry, which is carried on in urb. and rural



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dist., produces a wide range of B. ware for agric., commercial, and domestic purposes. The chief urb. centre is London, whilst rural B.-makers are to be found in most cos. but are considerably fewer in the N. half of the country, excepting the Furness dist. of Lancs which is the centre of the oak spale B.-making industry. See T. Okey, *An Introduction to the Art of Basketry*, 1932; H. H. Bobart, *Basket-work Through the Ages*, 1936; K. G. Stott, *Cultivation and Uses of Basket Willows*, 1955.

Basket Ball, game played by opposing teams of 5 with an inflated ball, the average dimensions of the court being

85 ft by 46 ft. At each end there is a metal hoop 18 in. in diameter (commonly called the basket) which is fixed to a back-board 6 ft by 4 ft, the hoop being 10 ft from the ground. Each team may use 7 substitutes. The object of the game is to throw the ball through the hoop. Two points are awarded for each field goal and one for a penalty. The ball, which is about 30 in. in circumference and 20 oz. in weight, must be played with the hands and not kicked. It is a no-contact game; personal contact such as kicking, pushing, slapping is a foul and the penalty is one or two free shots for the goal from a free throw line 15 ft from the basket. Playing time is 20 min. each way with a 10-min. half-time interval. The game was invented in 1891 by James Naismith of the Y.M.C.A. at Springfield, Massachusetts, and is now recognised as one of the most popular team games in the world. Fifty-two countries are registered members of the International B. B. Federation. European, World, and S. American championships are regularly organised for both men and women. The 1936 Olympic Games saw 23 countries playing in the B. B. competition, and in 1952 34 national teams competed at Helsinki.

Basket-fish, name given to echinoderms, of the class Ophiuroidea. They resemble star-fish in appearance, having the same number of arms, and obtain their name from their habit of coiling these arms over their mouths.

Basking Shark, or **Sun-fish** (*Cetorhinus maximus*), large shark of the family Lamnidae which is found in the temperate seas of both hemispheres. After the whale-shark it is the largest of living fishes, growing to a length of 35 to 40 ft. Like the whale-shark it feeds on small animals in the plankton, these being strained from the water by the long, bristle-like gill-rakers. The external gill clefts are very large and the large mouth is provided with numerous small conical teeth.

Basle (Switzerland), see **Basel**.

Basnage, celebrated Protestant Fr. family: (1) Nicolas, a religious refugee, who settled in Norwich, where he had a congregation. Afterwards returned to France. (2) Benjamin (1580-1652), his son, pastor of his father's church at Carentan; a zealous defender of the Fr. Reformed Church. (3) Antoine (1610-1691), son of above; after the revocation of the edict of Nantes escaped to Holland. Died at Zutphen, where he had a pastoral charge. (4) Samuel (1638-1721), son of above, b. at Bayeux; preached there at first, but escaped to Holland with his father. Died at Zutphen. He wrote voluminously in French and Latin. (5) Henri (1615-95), youngest son of Benjamin, b. at St Mère Eglise; studied for the bar, and became one of the most eloquent advocates in the parliament at Rouen. His works were pub. at Rouen, 2 vols. fol., 1776. (6) Jacques (1653-1723), son of above, the most celebrated of his family. Studied at Saumur under Tanaquil le Févre and at Geneva and Sedan. Ordained pastor at Rouen, 1676. In 1685, when

the church was closed, he received permission to retire to Holland; settled at Rotterdam; knew many scholars of all countries, including Bayle; was esteemed by Voltaire. His works were principally theological. (7) Henri (1656-1710), son of Henri above, b. at Rouen, followed the profession of his father. On the revocation of the Edict of Nantes fled to Holland, where he died.

Basoché, or **Bazoché**, corporation of the clerks of the parlement of Paris which existed from about 1302 until the revolution. Philip the Fair is said to have been the founder, and to have granted the members certain privileges. Other B.s included that of the clerks of the Palais de Justice, etc.

Basque Provinces (Sp. *Provincias Vascongadas*), name given to 3 provs. of N. Spain: Alava, Guipúzcoa, and Vizcaya (qq.v.). The considerable autonomy enjoyed by the region was curtailed in 1876 as a result of Basque support of the Carlists (q.v.). During the civil war of 1936-9 (see **SPAIN, History**), the region supported the republicans, and in Oct. 1926 a short-lived autonomous Basque gov. was set up at Guernica (q.v.). Area 2736 sq. m.; pop. 1,100,000. See **BASQUES**.

Basque Roads, Action in the, naval engagement in the B. R., below the ls. of Aix, near Rochefort, where the Fr. fleet of 14 ships was attacked by Lord Cochrane, in command of the fireships, and Lord Gambier, 11-12 April 1809. There was a panic among the Fr. sailors; 12 ships ran aground and 4 were destroyed. Cochrane thought that the victory would have been more complete had he received more active support from his superior Gambier. The latter was accused of negligence at a court martial, but was acquitted, and Cochrane was obliged to retire on half-pay.

Basques (Sp. *Vascongados*), race of people dwelling on the slopes of the Pyrenees, occupying, on the S. in Spain, Navarra (q.v.) and the Basque provs of Alava, Guipúzcoa, Vizcaya (qq.v.); on the N., the Fr. dept of Basses-Pyrénées (q.v.). The word Basques is derived from the Lat. *Vascones*, which word in its Germanic form, *Wascones*, has also given a name to the Gascons, an entirely different people. Perhaps no race has raised so much discussion as to its origin as that which we are now considering, and the question is still unsettled. There is no doubt as to the extreme antiquity of the Basque settlements on the Pyrenees. Moreover place names throughout Spain, Sicily, Sardinia, and Corsica bear a strong resemblance to Basque names, and may sometimes be explained from Basque derivations. It is thought that the Basque race is connected with the anct Iberian or Celtiberian (see **CELTIBERI**) and was dispersed over the dists. named above. Some, however, deny the connection of the B. with the Iberi of the Romans, and make them an indigenous people who have never extended over larger regions than their present quarters. A third theory connected them with the fair-skinned

African races, and would carry their origin back through some of the Berber tribes, through the anct Libyans to a people represented on the Egyptian monuments. Lastly may be mentioned a theory deriving them from the inhab. of a lost Atlantic continent, represented also by the Guanches (q.v.) of the Canary Is., and by a certain fair-skinned W. African race. The B. themselves are fairer than the peoples of the S., but darker than the N. races. The race is by no means pure, and a large range of types is found. As in complexion, so in stature, they occupy an intermediate place between the N. and S. Europeans. Their skulls are both dolichocephalous and brachycephalous, and have certain peculiar characteristics. Collignon tells us that the Basque type differs from all those he knows of Europe and N. Africa. The B. know themselves by the name *Euskaldunak*, a word formed from the name of their language *Euskara*. The origin of this word is uncertain, but the most probable meaning is 'speaking plainly.' Their tongue stands alone among the languages of Europe, as the only remaining example of a consistent incorporative and agglutinative tongue. Though no close connection is to be traced, it shows affinity with the Finnic and Magyar families, which are simply incorporative, and the N. Amer. incorporative and polysynthetic languages. Morphologically it occupies a position between these 2 groups, constituting a separate class. It is, as has been said, agglutinative, modifications of meaning and grammatical relations not being expressed either by prepositions or by inflections. Instead, there is a system of post-fixing, various additions being made one after the other. Thus, *valdi*, 'horse'; *valdia*, 'the horse'; *valdiak*, 'the horses'; *valdiaren*, 'of the horse', etc. There is a lack of general and abstract terms, though an abundance of particular terms. The personal pronouns, *ni*, 'I'; *hi*, 'thou'; *gu*, 'we'; *zu*, 'you', bear a superficial resemblance to the Hamitic languages. Basque has no genders except in the verb, where a suffix is added to show the sex of the person addressed. Thus *estakinal* means 'I do not know it, woman'; *estakial* (for *estakikal*), 'I do not know it, man.' The verb incorporates with itself not only the pronoun, but also the direct and indirect complements. Thus there are separate forms for 'I give it,' 'I give it to you,' 'I give them to you,' etc., varying according to the sex of the person addressed. The regular verbal conjugations for the transitive and intransitive are now used but rarely, being reserved for the verbs 'to have' and 'to be' respectively. The language has, on the other hand, developed a conjugation by combining auxiliaries with the participles of all the other verbs. Thus instead of saying *dakust*, 'I see it,' the form is *ikusten dut*, 'I have it in seeing.' Originally there were but 2 tenses, the present and the imperfect, but a conditional future has now been formed. There are no clearly defined moods. Syntax is simple,

as in all agglutinative languages, and the phrases are short. Composition is used to such an extent that many phrases originally distinct have now become confounded. The dialects vary considerably, 25 in number, in 8 divs., which can be again reduced to 4 main dialects, those of Guipúzcoa and Viscaya (Spain) and Labourdin and Souletin (France). The hist. of Basque literature is short as no anct monuments remain. The first printed book in the language was the *Linguae Valconum Primitiae*, a collection of poems by Bernard d'Echepare. Next to this comes the trans. of the N.T. by Licarrague, acting under the instructions of Joanne d'Albret (La Rochelle, 1571), which ranks as the great classic of the language. Before the 19th cent. there existed no national literature, but attempts have been now made to form one. The few hundreds of vols. printed in Basque consisted chiefly of trans. from French, Spanish, or Latin. The B. are profoundly religious, and their country has produced 2 great champions of the faith. Ignatius Loyola, founder of the Society of Jesus, and Francis Xavier, the great missionary (qq.v.). Most of their older literature, though no MS. exists older than the 18th cent., is religious. Their legends and *pastorales*, a kind of open-air drama, are mainly derived from the French. The B. have ever shown the ability to retain their independence. Though the Romans conquered them, they did not assimilate them in any way. The Visigoths did the same and no more. At the beginning of the 10th cent. the B. to the S. of the Pyrenees were brought into the kingdom of Navarre, but they still retained their *fueros*, or assemblies, in which they ruled themselves to a great extent. The B. are engaged in agriculture and fishing, and many of them have emigrated to the Newfoundland cod-fisheries. Their great agility was remarked in the 8th cent., and still remains a characteristic. They make excellent soldiers and sailors, and their anct renown as pirates is continued by their success as smugglers. They are extremely conservative in dress, customs, and tradition. The dress of the men is simple, consisting generally of the knickers, girded with a large red belt, open waistcoat, short tight coat, and carelessly tied kerchief round the neck, the whole surmounted by the national beret, a red or blue cap. Pelota (q.v.) is a popular game with the B. The number of B. in Europe is about 700,000 of whom about 125,000 are in France, and the rest in the Sp. provs. Of late years there has been a great deal of emigration, especially to S. America, where it is estimated that there are at present no fewer than 200,000 B. scattered over the Argentine Rep., Mexico, and Cuba. See BASQUE PROVINCES.

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Spanish Language (with Basque), 1936. GENERAL: K. W. Fedden, *The Basque Country*, 1921; P. S. Ormond, *The Basques and their Country* (chiefly the Fr. provs.), 1925; R. Gallop, *A Book of the Basques*, 1930; T. C. Smith, *San Sebastian and the Basque Country*, 1935.

Basra, Bassora, or Bussora: 1. Div. and liwa of Iraq and formerly a Turkish vilayet of Mesopotamia. The dist. of B. includes also the liwas Amara and Muntafik, the total area being 53,580 sq. m. and the pop. (1947) 1,029,953 (B., 352,039; Amara, 308,108; Muntafik, 369,806).

2. A port on the Shatt al-Arab about 67 m. from the sea. A tn was in the

B. and Bagdad and a railway connects B. through the cap. with Stamboul and Persia. At some period the tn moved to its present position. It consists of 3 parts: B., Ashshar Creek, and Maqil, the port; the dist. is intersected with ditches and canals and is only 8 ft above sea level. There are no anct monuments. Pop. 37,000.

Bas-relief, or low-relief, term used to denote forms of sculpture which project very little from the background. The It. terms *basso-rilievo*, *mezzo-rilievo*, and *alto-rilievo* (q.v.) were used at the time of the Renaissance according to the degree of projection from the surface forming a



W. F. Mansell

BAS-RELIEF

A group from the Elgin Marbles, British Museum.

vicinity in anct times but the Arab tn was a new foundation (AD 637), originally a permanent camp to serve as a base for further campaigns with the desert behind to secure the retreat of the Bodouin Arabs in case of need. It was some 9 m. SW. of the modern tn. Under the Umayyad caliphs the governor of B. administered Khorasan (N. Persia) by a deputy; this shows its importance. Under the early Abbasid caliphs it was a lively centre of literary life and its position made it the emporium of trade with the far E. In 1534 the Turks occupied it. In the 17th cent. a native made himself an independent ruler and opened the port to European ships, first Portuguese, then Dutch, and then English. The last independent ruler had to take refuge in Persia; then Turks and Persians fought for the tn till 1779 when the Turks won. During the First World War B. was equipped as a modern port to take ocean-going ships; now it has an air-port, seaplane base, wireless station, and the bar at the mouth of the riv. has been dredged to take ships of 22½ ft draught at low tide. Riv. steamers ply between

background. These terms fell out of use, and 'B.' became the general term to signify all 'relief' sculpture, as distinct from sculpture in the round. The anct Egyptians appear to have been the earliest people to practise this art, but the Persians, Assyrians, and Babylonians also represented their exploits and divinities in this way. The figures shown in these early B.s are stiff and regular in outline. After the time of Crassus, the marble sarcophagi at Rome were usually decorated at the ends with B., many well-known legends being thus portrayed. The Elgin Marbles in the Brit. Museum, which provide examples of both high and low relief, constitute the best anct example of this class of art, whilst the B.s of Donatello, Canova, Flaxman, and Thorwaldsen were noted in later ages.

Bas-Rhin, see RHIN, BAS-.

Bass, George (d. 1812), explorer, b. Asworthy, Lincs. He was apprenticed to a surgeon at Boston, Lincs; joined the navy and became surgeon to H.M.S. *Reliance*. In 1795 he sailed to Australia, and explored the coast of New S. Wales and Tasmania with Flinders (q.v.).

1795-1800. B. Strait owes its name to him.

Bass, Michael Thomas (1799-1884), Brit. brewer. He made his family business into the largest of its kind, with a world-wide reputation. He sat in Parliament as a Liberal, 1848-83, where he was a strong advocate of social reform.

Bass (It. *basso*, low), musical term denoting the lower part in the harmony of a composition, the lowest pitched of a class of instruments, or the lowest male singing voice. The B. part contains more frequently than not the fundamental notes of the chords, and the pedal-'point' is formed on the long-sustained sound of a single note of it. The ordinary compass of the B. voice is from F below the staff in the B. clef to about D above it.

Bass, or **Basse**, name applied to certain perch-like fishes of the order Perciformis. The Eng. varieties are marine, while the Amer. comprise sev. fresh-water fish. The common bass of the family Serranidae is known as *Morone labrax*, receiving its specific name from its wolf-like voracity; it is common to the Mediterranean. Two species of black B. afford sport for Amer. anglers; they are the *Micropterus salmoides* and *M. dolomieu* of the sun-fish family, Centrarchidae. Nearly all B. are edible.

Bass, Double, see DOUBLE BASS, also VIOLIN.

Bass, Figured, see THOROUGH-BASS.

Bass, Fundamental, see FUNDAMENTAL BASS.

Bass, Ground-, see GROUND-BASS.

Bass, Thorough-, see THOROUGH-BASS.

Bass Clef, see CLEF.

Bass Rock, conical insular rock at the mouth of the Firth of Forth, Scotland, 3 m. from N. Berwick, about 1 m. in circumference, rising to a height of 350 ft. It has an imposing aspect, with precipitous lofty cliffs; a cavern runs from the NW. to the SE. which is explorable at low tide. It is inaccessible save at one shelving point on the SE. side. Purchased by the Eng. gov. in 1671, the castle was converted into a state prison in which sev. eminent Covenanters (q.v.) were confined. The rock was held for James II by 16 Jacobites against a small army of William III (1691-4). The fort was demolished in 1701. The rock is now private property, being farmed for the sea-birds that breed there.

Bass Strait, broad sea channel, average width c. 140 m., and some 200 m. long, separating Australia from Tasmania. It is studded with is., the chief of which are King Is., and the Furneaux (q.v.) group. Navigation is difficult as a result of the numerous coral reefs. The strait was discovered in 1798, and named after George Bass (q.v.).

Bass Tuba, another name for the bass saxhorn in F or E flat. It is sometimes applied to the euphonium.

Bass Viol, or **Viola da Gamba**, bass instrument of the viol family. It had six strings. The name B. V. was sometimes wrongly given to its successor, the violoncello.

Bassadore, see BASIDU.

Bassandyne, Bassendyne, or Bassinden, Thomas (d. 1577), Scottish printer, book-binder, and bookseller at the Nether Bow, Edinburgh. He printed the earliest trans. of the N.T. produced in Scotland in 1576, and also an ed. of Lindsay's works. See Dobson, *History of the Bassandyne Bible*, 1887.

Bassano, otherwise **Jacopo da Ponte** (1510-92), It. painter, b. Bassano, son and pupil of Francesco da Ponte. He was sent by his father to Venice to study the Venetian school of painting. His work met with success, and Tasso and Ariosto sat to him for their portraits. A painter of considerable influence, he is noted for the rustic and peasant elements in his compositions. His best works are the 'Entombing of Christ' at Padua, and the 'Seizure of Christ.' He had 4 sons who worked in the prolific family studio: (1) Francesco, commonly called the younger B. (1548-91), studied under his father, and achieved considerable reputation, practising at Venice. In a fit of delirium he threw himself out of a window and was killed. (2) Giovanni (1553-1613), known as a copyist of his father's work. (3) Leandro (1558-1623), distinguished himself as a portrait-painter, but painted historical and sacred subjects occasionally. (4) Girolamo (1560-1622), employed by his father in copying, but contributed an original piece of 'St Barbara and the Virgin' at Bassano.

Bassano (del Grappa), It. tn, in Veneto (q.v.), on the Brenta (q.v.), 17 m. NE. of Vicenza. The Austrians were defeated here by Napoleon (q.v.) in Sept. 1796, and at nearby Monte Grappa there was heavy fighting during the First World War. During the Second World War the tn was seriously damaged, but many structures, including the remarkable wooden bridge, have since been repaired. B. has ant. walls, a 10th-cent. cathedral, and a museum which contains, among other masterpieces, works of the famous B. (q.v.) family of painters. Silk, paper, porcelain, and wax are manuf., and there is a trade in wine and olive oil. Pop. (tn) 15,000; (com.) 27,300.

Bassantin, or Bassington, James (c. 1504-68), Scottish astronomer, educ. at Glasgow, and settled in Paris where he taught mathematics and astronomy. His best-known work was a *Discours astronomique*, Lyons, 1577, trans. into Latin by de Tournes (Torresius) under the title of *Astronomia J. Bassantini, Scoti*, Geneva, 1559. His planetary system is that of Ptolemy.

Basse, or Bas, William (c. 1583-1653), Brit. poet. He was a retainer of Sir Richard Wenman of Thame Park, Oxon. He wrote on country life and was the author of *Sword and Buckler*, 1602, and *Great Brittaines Sunnes-set*, 1613. He is remembered for his epitaph on Shakespeare, and for a song quoted in Walton's *Compleat Angler*. His works were ed. by R. W. Bond, 1893.

Basse-terre: 1. Seaport and cap. of the W. Indies, on the SW. coast of the is. of St Kitts, Leeward Is., of St Kitts-Nevis residency. *Entrepôt* trade in sugar,

cotton, salt, fruits with nearby is. Cable station and airfield. Pop. 12,200.

2. Is., W. part of Guadeloupe, separated from the E. part by a narrow channel; rocky and mountainous, it contains the volcano *Son Frière* (4858 ft) which erupted in 1956 after being dormant for 120 years.

3. City, cap. of Guadeloupe, on SW. coast of B.-T. is., centre of rich agric. region. Pop. 10,000.

Bassedau, Johann Berend, see BASEDOW.

Bassée, La, Fr. tn in the dept of Nord, on the La B. canal, near Lens. It occupied an important strategical position on the W. front in the First World War; in the first battle of Ypres the allied line ran through La B. (see FRANCE AND FLANDERS, FIRST WORLD WAR CAMPAIGNS IN). Pop. 4900.

Bassein: 1. Seaport of Lower Burma, and cap. of the dist. of B., on the riv. of that name. The H.Q. of the Irawadi div., B. is the second port of Burma and can handle ships up to 10,000 tons. Prin. export is rice, and coal, salt, cotton goods, etc., are imported. Pop. 45,700.

2. Tn in the presidency of Bombay, India, 28 m. NE. of Bombay. It was ceded to the Portuguese by the King of Gujarat in 1534, and remained in their possession until taken by the Mahrattas in 1739. It was taken over by the British in 1818. It contains notable remains of the Portuguese fort and of many fine buildings of the 16th and 17th cents. Pop. 13,969.

Bassenthwaite, lake (4 m. long and $\frac{1}{2}$ m. wide), Cumberland, England, lying on the R. Derwent some 5 m. above Derwent Water (q.v.).

Basses-Alpes, see ALPES, BASSES.
Basses-Pyrénées, see PYRÉNÉES, BASSES.

Basset, Fr. breed of medium-sized hound with a long body, short crooked legs, and heavy head, which was introduced into England for the first time in the early 17th cent. It was formerly used in the baiting of badgers, but is now employed in deer-hunting and in hare-hunting, in which it shows its persevering but slow nature. There are both smooth and rough-haired varieties, but the colouring is usually tan on the head and black and white on the body.

Basset Horn (It. *corno bassetto*, wrongly *corno di bassetto*), wind musical instrument invented in Germany in 1770. It is similar to a clarinet in fingering, but transposing down a fifth. It contains additional low notes. The scale as written embraces nearly 4 octaves, from C, the second space in the bass clef to G in altissimo, including every semitone; but its real notes, in relation to its use in the orchestra, are from F below the bass stave, to C, the second ledger line above the treble. 'Corno di Bassetto' was an early pseudonym of George Bernard Shaw as music critic.

Bassett, John Spencer (1867-1928), Amer. historian, b. Tarboro, N. Carolina. Educ. in N. Carolina. Specialising in hist., he became prof. of Amer. hist. at

Smith College, Massachusetts, from 1906 to 1914, when he became head of the hist. dept at the same institution, holding this post until 1928. He wrote many books dealing with the hist. of his native state, and, in addition, the following: *The Life of Andrew Jackson*, 1911; *A Short History of the United States*, 1913; *The Lost Fruits of Waterloo*, 1918; *Our War with Germany*, 1919; *The League of Nations, a chapter in World Politics*, 1928.

Bassia, see MADHUGA.

Bassières, Jean Baptiste, Duke of Istria (1768-1813), Fr. marshal. In the Constitutional Guard of Louis XVI he took part in the Sp. war. He won honour in the E. Pyrenees and the Moselle. In 1796 he served under Napoleon as captain during the It. campaign. A distinguished career saw his return with Napoleon from Acro and Aboukir, when he was second-in-command of the Consular Guard. He was made marshal of France in 1804, and was created Duke of Istria 5 years later.

Bassigny, dist. in the former prov. of Champagne, France, now forms parts of the depts of Haute-Marne, Meuse, and Aube. Its chief tns were Langres, Chaumont, and Bourbon-les-Bains.

Bassinden, Thomas, see BASSANDYNE.

Bassington, James, see BASSANTIN, JAMES.

Basso Continuo, It. for thorough-bass (q.v.).

Basso-rilievo, see BAS-RELIEF.

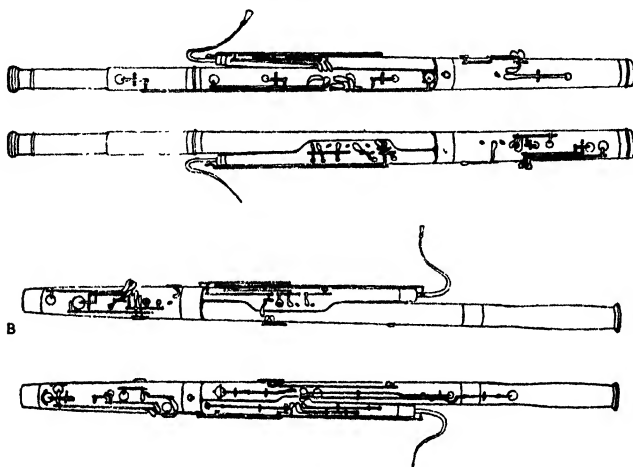
Bassompierre, François de (1579-1646), marshal of France and captain-general of the Swiss Guard, b. Lorraine of a noble and military family; became a favourite of Henry IV; took part in the religious wars, appointed captain-general of the Swiss Guard; under Louis XIII. ambas. to Spain; 1626, sent to England by Richelieu to enforce the marriage treaty between Henrietta Maria and Charles I in so far as it related to toleration of Rom. Catholic worship. Supported Marie de' Medici against Richelieu, at whose instance he was arrested and sent to the Bastille for 12 years; released at Richelieu's death; d. of apoplexy 3 years afterwards. See *Mémoires du Maréchal de Bassompierre*, 1723, and *Bassompierre's Embassy to England*, 1819.

Bassoon (Fr. *basson*, Ger. *Fagott*, It. *fagotto*), wood-wind instrument with a double-reed mouthpiece, forming the bass of the oboe family. Its direct ancestor was the bass pommer, which was straight and 6 ft in length; the tubes of which the B. is formed resemble a bundle (fagot), hence the Ger. and It. names for the instrument. It consists of 5 pieces, joined together into a wooden tube 93 in. long, which has a conical bore tapering from a diameter of $1\frac{1}{2}$ in. at the bell to $\frac{1}{2}$ in. at the reed. The pieces are known as the bell, the long joint, the wing, the butt, and the crook, to the last of which the mouthpiece is attached. The performer holds the instrument in a diagonal position, passing its strap around his neck; the notes are produced by 7 holes, and 16, 17, or 19 keys. The mechanism and fingering are intricate. From an acoustic point of view the B. is badly constructed,

but in practice it affords the artist a scope surpassed only by the stringed instruments. Its compass comprehends 3 octaves, rising from B flat below the bass staff. It has been a favourite instrument with all the masters after Bach and Handel, and Mozart wrote a concerto for the B., with orchestra. The range of the double B. is roughly an octave below that of the B. It is much employed in the modern orchestra to add the lowest bass to the woodwind section.

Aristaenetus. B.'s literary labours were devoted to verbal criticism.

Bast, in its 2 forms, soft and hard, constitutes what is known in botany as phloem. The soft B. consists of sieve tubes, companion cells, and parenchyma cells, and the sieve tubes are employed in carrying food material from the leaves to the rest of the plant; the hard B. is composed of long, narrow B. fibres, resembling wood fibres, and parenchyma cells. In commerce the B. fibres of flax,



A, Modern French.

B, Modern German.

Bassora, see **BASHA**.

Bassora Gum, name given to a gum derived from plum and almond trees, and often used to adulterate gum tragacanth; came originally from Bassora or Basra.

Bassus, **Caesius**, Rom. lyric poet of Nero's reign. He was a friend of Persius (q.v.), whose works he ed. and whose sixth satire is addressed to him. B. is said to have perished in the eruption of Vesuvius (AD 79). Quintilian praises him (Instit. x, I. 96). Fragments of his works survive, and he is generally identified with the author of a partially extant treatise *De Metris* (ed. Kell, 1885).

Bassus, genus of hymenopterous insects of the family Braconidae. They are closely allied to the ichneumon flies, have 4 wings, long and narrow bodies, and frequent the flowers of umbelliferous plants.

Bast, **Friedrich Jakob** (b. c. 1772), Ger. scholar, b. in the state of Hesse-Darmstadt. He afterwards studied in the univ. of Jena, under Profs. Griesbach and Schutz. His first literary essay was a commentary upon Plato's *Symposium*, which was followed in 1796 by a specimen of an intended new ed. of the letters of

hemp, and jute are sold for various purposes. See **VASCULAR SYSTEM**.

Basta, **Georg**, **Baron von Sult** (1550-1607), Austrian general, b. at Rocca, S. Italy. He served under Alexander Farnese in the Low Countries, 1589-90, and occupied Transylvania in 1598. In 1603 and 1604 he suppressed risings which were largely due to his cruel administration.

Bastan, see **BAZTAN**.

Bastard (O.F. *filz de bast*), person b. out of lawful wedlock and not subsequently legitimated. By the Eng. law a child b. during the marriage of his parents is legitimate, even if the child is begotten out of matrimony. The fact of birth during marriage or within a certain time after the husband's death raises a strong presumption of legitimacy, rebuttable only by proof of non-access on the part of the husband. By the Scottish law and most continental systems, which are based on the canon and civil laws, a B. may be legitimated either by the subsequent marriage of his parents, or by special dispensation not affecting the rights of third parties. In 1926 the Eng. law was assimilated to the Scots law by the Legitimacy Act of that year, under

which an illegitimate child can become legitimate on the subsequent marriage of the parents, provided at the time of birth both were free to marry. The father of a legitimated child must, at the time of the legitimating marriage, be domiciled in England or in Wales. The rights of succession to property acquired by legitimation are, however, confined to dispositions made after legitimation took place. Civilly the B. is *filius nullius* for most purposes, and is therefore heir to none of his reputed ancestors and entitled to no share of the personal property of his reputed parents if they die intestate. Nor has he a surname until he acquires one by reputation. But Eng. law admits a B. to be the son of his putative father and his natural mother for purposes of maintenance. A B. takes as his primary settlement for public assistance purposes the place where he was b., but a legitimate child takes his father's bp. The Eng. law relating to the maintenance of B.s is to be found in a number of statutes, the nature of the changes in the law indicating that no settled principle has regulated Eng. legislation on this subject. By the Bastardy Laws Amendment Act, 1872, the mother of a B. may summon the putative father before the petty sessions within 12 months after the birth of the child, or at any later time if he is shown to have contributed to the child's support within 12 months, and the justices, on the mother's evidence being corroborated, may adjudge the man to be the putative father and order him to pay a weekly sum for its maintenance. Such order becomes invalid after the child attains 16. An appeal lies to quarter sessions. The mother only may apply for such an order, though in case of her death or incapacity or omission to apply before the child becomes chargeable to National Assistance, the public authority concerned may proceed against the putative father. The custody of a B. belongs to its mother in preference to the putative father.

Bastard Bar is a name sometimes employed erroneously in speaking of the baton sinister (see **BATON**).

Bastard Palm, see **MELITTIS**.

Bastardy, Declarator of, suit which holds in Scots law for the disposal of the effects of a deceased person who was illegitimate. The recipient of the estates must receive a deed of gift from the Crown to state that he is entitled to them, and the defender is represented by any person or persons who could pretend to heirship if the owner had been b. in wedlock.

Bastl, see **BAZA**.

Bastia (*bastiglia*, a fortress), most important city and port of Corsica (q.v.), 65 m. N.E. of Ajaccio (q.v.). It is on the E. coast, and is overlooked by a 16th-17th-cent. fortress which has replaced the original *bastiglia* built by the Genoese in 1380. There are sev. fine churches. Much destruction was caused during the Second World War. The chief industries are fishing, and the manuf. of foodstuffs and pipes. Pop. 52,300.

Bastian, Adolf (1826-1905), Ger. traveller and ethnographer, b. Bremen. He

was educ. as a physician, but in 1851 he started on the first of his many voyages. This first voyage lasted for 8 years, and he travelled round the world. Between 1864 and 1866 he visited the Indian Archipelago and Japan, the desert of Gobi, the Ural and Caucasus Mts, and the Caspian and the Black Seas. He was created prof. of ethnology and administrator of the ethnological museum at Berlin, and later was president of the Berlin Anthropological Society. He organised the station of Chinchoxo on the coast of Loango, and completed the ethnographical collections of the Royal Museum at Berlin. Between 1875 and 1891 he undertook journeys to Oceania, central and S. America, and from central Asia to America. He wrote numerous standard books on ethnology and anthropology, his chief work, *The Peoples of Eastern Asia*, being pub. in 1866-71.

Bastian, Henry Charlton (1837-1915), biologist and physician, b. Truro. He was educ. at Falmouth and at Univ. College, London. He was assistant curator in the univ. museum 1860-3, and 1864-6 head officer in Broadmoor Criminal Lunatic Asylum. In the latter year he was appointed lecturer on pathology and assistant physician at St Mary's Hospital, in 1875 prof. of pathological anatomy at Univ. College, and 1887-95 prof. of medicine and clinical medicine. He supported the theory of spontaneous generation. He was one of the founders of Brit. neurology; his best work in this field was on aphasia and other speech defects. His more important works include *Modes of Origin of Lowest Organisms*, 1871, *Evolution and Origin of Life*, 1874, *Brain as an Organ of Mind*, 1880, and *Treatise on Aphasia and other Speech Defects*, 1898.

Bastiat, Claude Frédéric (1801-50), Fr. economist, b. Bayonne. Educ. Saint-Sever and Sorèze colleges, and in 1818 entered the counting-house of his uncle. In 1825 he retired to a property at Mugron, of which he became the owner on the death of his grandfather. Here he passed his time in farming and study until the revolution of 1830, which he welcomed. He became a *juge de paix* for his canton in 1830, and in 1832 a member of the General Council for the Landes. He followed the progress of Cobden's Anti-Corn-Law League, and formed a parallel association in France. After the revolution of 1848 he was elected to the constituent and legislative assemblies. He d. at Rome, 24 Dec., of a lingering disease. His pamphlets against Socialism and Protection are considered to be masterly; his great economic work was cut short by death.

Bastien-Lepage, Jules (1848-84), Fr. painter, b. in the vill. of Damvillers, in the dept of Meuse. In 1867 he went to Paris to the Ecole des Beaux Arts, where he studied under Cabanel, and in 1874 his 'Song of Spring,' a study of rural life, attracted attention at the Salon. 'The Hayfield,' which he first exhibited at the Salon of 1877, and which went to the Luxembourg, is a typical example of his truthful and simple style which had some

influence in England. He gained the cross of the Legion of Honour in 1879 by his portrait of Mme Sarah Bernhardt and exhibited in the Royal Academy of 1880. See study by G. Clausen, with memoir by A. Theurier, 1892.

Bastille, Fr. name for any castle with towers, but as a proper name it signifies the old state prison and citadel of Paris. This was built about 1369 by Charles V. but came to be used as the place of confinement for persons of rank or political importance. It was popularly detested as an emblem of tyranny. The capture of the B. on 14 July 1789 marked the beginning of the Fr. Revolution. De-launay, the governor, was lynched as he was being taken to the *Hôtel de ville*, and the B. was completely destroyed by the mob. A column in the Place de la Bastille now marks its site. See F. Kirchelsen, *The Grim Bastille*, 1930.

Bastinado (Sp. *bastón*, cudgel), European name for an oriental form of punishment which consists in inflicting blows with a stick upon the victim, generally on the soles of his feet, sometimes on his back.

Bastion (Fr., from It. *bastione*), in fortifications, is a mass of earth which stands out from the rampart of which it forms the main portion. B.s are faced with turf or stone, and consist of 2 flanks, which serve to protect the neighbouring B.s, and 2 faces, which meet in an angle towards the enemy, and command the outworks and the ground in front. The fifth side, which is open to the interior, is known as the gorge.

Bastogne, small tn in the prov. of Luxembourg, Belgium, the scene of the Rundstedt (q.v.) offensive in Dec. 1944. See WESTERN FRONT IN SECOND WORLD WAR.

Bastwick, John (1593-1654), physician and Puritan, b. Writtle, Essex, and educ. at Emmanuel College, Cambridge. He pub. a number of pamphlets attacking ceremonial in the Church of England, for which he was fined, pilloried, had his ears cut off, and was imprisoned. The proceedings were reversed by Parliament in 1640.

Basutoland, one of the 3 High Commission Territories in S. Africa, administered under general control by the Commonwealth Relations Office in London. Local control is by the High Commissioner for the U.K. in the Union of S. Africa who is represented in B. by a resident commissioner. B. is a member of the S. African Customs Union. It is bounded on the N. and W. by the Orange Free State, on the S. by Cape Province, and on the E. and NE. by Natal. The surface is mountainous, and the average height above the sea is 6000 ft. The Maluti Mts and the Molappo Mts, which are parallel to the Quathlamba Range, divide the country into 3 almost equal dists.; the headwaters of the Orange R., the Tugela R., the Kornet Spruit, the Caledon R., and the Senka R. lie in B. The Maletsunyane Falls (660 ft) are the twelfth highest waterfalls in the world. The climate is healthy and invigorating,

but cold in winter, and the average rainfall is about 32 in. per annum, most of it falling in the summer. B. is the best grain-producing country in S. Africa, and maize, Kafir corn, and wheat are grown over an area of some 730,000 ac. The ponies of B. are hardy and sure-footed, whilst sheep and cattle are also reared in large numbers. Mule-breeding has been introduced. Diamonds were discovered in 1856, but whether or not in payable quantities is uncertain. B. has a great hydro-electric potential, and if the waters were harnessed power could be sold profitably to the new Orange Free State gold-field. Surveys have been carried out and reports are being examined (1937). Considering the mountainous nature of the country the roads are good, but there are no railways, except for a line that crosses the W. border to connect Maseru with Bloemfontein. Wool, mohair, cattle, and hides are the chief exports, also wheat and Kafir corn. There are few forests, and much of the country is uninhabitable. Whites are not allowed to settle without special permission. The natives are intelligent, industrious, and brave. Ritual and medicine murders are still prevalent. Dr G. I. Jones prepared a valuable report on this subject in 1950 for the Colonial Office. The area of B. is 11,716 sq. m., and pop. (1946), natives, 561,289; whites, 1689; Asiatics and others, 876.

History. The Basuto of B. are commonly believed to have been the remnant of a number of tribes which were dispersed by the wars waged by Mosilikatze, King of the Matabele, in the early part of the 19th cent. Their earliest ruler was Moshesh or Moshoshe, who welded his dispersed tribesmen into a political unity. Moshesh is the Basuto national hero, and Thaba Bosiu or Bosigo was the scene of his triumph against the Zulus and others. No other spot in B. carries so much of the hist. of the nation as this small mt where Moshesh first took his stand against his foes, and where all the paramount chiefs of the past lie buried. In 1852 war broke out between Moshesh and the British, and the Basuto were defeated by Sir G. Cathcart at the battle of the Berea Mt. Between 1856 and 1866 there were border disputes with the Boer Orange Free State Rep.; the Basutos sought Brit. protection in vain, and in 1866 Moshesh ceded part of his ter. to the Boers, and acknowledged himself to be a subject of the Orange Free State. War again occurred and the Basuto again appealed to be taken under the authority of the Brit. Crown. In 1868 Sir Philip Wodehouse was authorised to recognise Moshesh and his people as Brit. subjects and to incorporate their ter. as a Brit. possession. A proclamation to that effect was issued on 12 Mar. 1868, which day is commemorated as a public holiday, 'Moshoshe's Day.' In 1871 B. was annexed to Cape Colony by an Act of the Cape Legislature, but was not made subject to the general law of the colony. The Basutoland Disannexation Law of 1883 brought the ter. under the immediate

authority of the Crown, and so it has remained. B. is economically dependent on the Union of S. Africa, by which ter. it is surrounded. Suggestions made from time to time by S. African politicians that the Basuto should throw in their lot with the Union have so far fallen on unresponsive ears, although a clause in the S. Africa Act, 1909, makes provision for the possible future inclusion of all High Commission Terr., and the inclusion of the 3 High Commission Terr. was in fact envisaged at the time of Union. In the First World War the Basuto offered to raise fighting regiments, an offer that was, however, declined. They raised £50,000 for presentation to King George V. In the Second World War, besides raising a fund for the purchase of a Spitfire squadron, Basuto to the number of 10,000 formed part of the African Auxiliary Corps, which served in the Middle E. and Italy.

See the standard hist. by Sir G. Lagden, *The Basutos* (2 vols.), 1909; also D. F. Ellenberger, *History of the Basuto*, 1912; E. A. T. Dutton, *The Basuto of Basutoland*, 1923; Sir Alan Plm, *Report on the Financial and Economic Position of Basutoland* (H.M.S.O.), 1935.

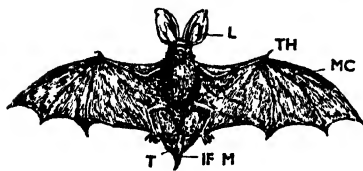
Basil, or **Basyle** (Gk *basis*, base; *kul*, matter), name formerly in use to indicate a metal or group of metals which acts as a base (q.v.).

Bat, or (popularly) **Flittermouse**, or **Rermouse**, mammal of the order *Chiroptera*, nearly related to the Insectivora (hedgehogs, shrews, etc.), but differing from them in having the power of bird-like flight. The fore-limbs are greatly developed, and between each of the 4 fingers is a skin expansion which extends to the side and the hind legs; another expansion spreads from the tail to the hind legs. The thumb does not share in the flight

small. However, the poorly developed visual sense is no handicap to a B., the experiments of Abbé Spallanzani in 1775 proving that B.s deprived of sight are yet able, in a room across which have been stretched a number of strings, to fly without coming into contact with one of them. Many have curiously shaped fleshy appendages called nose-leaves round the nose and mouth, and these 'leaves' direct the sounds emitted by B.s. The ears of all B.s are large, prominent, and mobile. B.s inhabit all parts of the globe except



LONG-EARED BAT



L, tragus; TH, thumb; MC, metacarpal; IFM, intertremoral membrane; T, tail.

modifications, and is clawed, its uses being those of attachment and occasional efforts to walk. The shoulder girdle and breast-bone are large, the latter extended to a keel, while the pelvic girdle is small. The bones of the limbs have large medullary cavities, but other bones are slight, and the ribs are flattened. The females have either 1 or 2 pairs of thoracic mammae, and give birth usually to a single offspring, which they carry with them during flight and which are born blind. The eyes of adult bats are functional but

the coldest regions, but abound in the tropics. In habit they are nocturnal, sleeping during the day head downwards, holding to some object with their curved claws. They hibernates in belfries, caverns, and forests, and in some cold climates, such as that of Canada, they migrate to warmer places for the winter season. At twilight they search for food, which in most species consists of insects, in others of fruit, and in a minority of the blood of mammals. They are classified according to the food they eat into *Megachiroptera*, or frugivorous forms, and *Microchiroptera*, or insectivorous forms. To the first class belong the *Pteropus edulis*, or flying fox, the largest known species, which sometimes measures 5 ft across the wing; *Epomophorus* of Ethiopia; *Cynonycteris* of the Egyptian pyramids. To the second class belong the genera *Rhinolophus*, or horse-shoe B.; *Nycteris*, or leaf-nosed B.; *Megaderma*, of which *M. lyra*, the lyre-B., attacks other B.s, frogs, and small mammals, and sucks their blood; *Vespertilio*, the common naked-faced B. of most countries; *Vesperugo*, of which *V. pipistrellus*, the pipistrelle, is well known; *Synotis*, of which *S. barbastellus* is the barbastelle. There are in all nearly 100 genera of B.s and among others should be mentioned the true vampires, or blood-suckers; these belong to the *Desmodus* and *Diphylla*, and will attack even men and horses; the genus *Vampyrus*, to which the repulsive *V. spectrum* is attached, consists strangely enough of frugivorous and

insectivorous animals. In Britain there are a dozen species of B.s. contained in 7 genera. The power of B.s. to detect and avoid obstacles when flying in the dark has recently been reinvestigated. It is now known that the ears form an essential part of the mechanism. Squeaks pitched so high as to be inaudible to the human ear are emitted through the B.'s mouth or nose. Each squeak, which is of very short duration (2/100 sec. or less), produces an echo when it is reflected from an obstacle. The echo is received by the ears, and the interval from the time of emission of the squeak indicates the distance of the obstacle: the longer the interval the greater the distance. The process has been termed echo location, and resembles the echo-sounding device used on ships to determine the depth of the sea. It is paralleled by the use of electro-magnetic ('wireless') waves in radar. Some blind humans appear to have similar power of echo location. See Barrett-Hamilton's *History of British Mammals*, vol. i, 1910; *Catalogue of the Mammals in the British Museum*, 1912; also the vol. on *Mammalia* by P. E. Boddard in the *Cambridge Natural History*, 1902. For echo location see *Nature*, civl. 490 (1945), and civill. 46 (1946), and P. Bourlès, *The Natural History of Mammals* (1955).

Bataan, prov. of Luzon, Philippine Is., on the W. of the Bay of Manila; pop. 22,901. The defence of B. Peninsula by U.S. forces under Gen. MacArthur against the Jap. armies from Jan. to April 1942 will go down in hist. as a great military exploit. It shed undying lustre on Amer. and Filipino arms, and gained valuable time for the Allies. Gen. MacArthur was assisted by 2 Amer. senior officers, Maj.-Gen. Jonathan Wainwright and Brig.-Gen. Albert M. Jones, the former taking command after Gen. MacArthur had flown to the defence of Australia. The defence of B. Peninsula against the immense preponderance in men and equipment which the Japanese enjoyed there, besides shattering illusions about the invincibility of the Jap. Army and Air Force, held up at a most critical juncture in the war other very large Jap. naval, military, and air forces which could otherwise have been used much earlier against Sumatra, Java, or other important positions held in the allied cause. It gave time for recovery of Amer. naval strength after the disaster of Pearl Harbour, and for the re-grouping of Brit. naval and air forces; and it was a serious setback to the Jap. strategical plan of rapid action and shock tactics. Off the S. point of the peninsula and in the entrance channel to Manila Bay lies the small rocky is. of Corregidor. This is., which was well fortified with 16-in. guns, was the last Amer.-Filipino position to fall. See also PACIFIC CAMPAIGNS IN SECOND WORLD WAR.

Batao, or Batag, tn of Luzon, Philippine Is., in the prov. of Ilocos Norte, near Laong. It is situated in a fertile dist. and grows rice. Pop. 22,587.

Batalle, Henri (1872-1922), Fr. dramatist, b. Nîmes. He studied painting at the

École des Beaux Arts, Paris, but was so successful with his first vol. of poems, *Le Beau Voyage*, 1905, that he gave up painting for literature. Turning to drama he produced a successful play, *La Lépreuse*, in 1896, and enhanced his international reputation with *Maman Colibri*, 1904, *Le Scandale*, 1909, and, later, with *La Vierge folle*, 1910, *Les Flambeaux*, 1913. His *Théâtre complet* was pub. in 12 vols. (1922-9). See J. B. Besançon, *Essai sur le théâtre de Batalle*, 1929.

Bataks, see BATTAS.

Batalha, tn of Portugal, in Leiria dist., 8 m. S. of Leiria (q.v.). It received its name from the battle of 1385 fought at Aljubarrota (q.v.) near by, and has a famous Dominican monastery, containing the tomb of Henry the Navigator (q.v.). Pop. 1000.

Batalpashinsk, see CHERKESSK.

Batalyoz, see BADAJOZ.

Batan, seaport of Panay Is. in the Philippines, a shipping centre for copra, hemp, and rice. Pop. 14,714.

Batan Islands, formerly Bashi Islands, group of is. situated between the is. of Luzon and Formosa, producing rice, corn, and coal. Pop. 10,700.

Batang, or Battam, is. opposite Singapore, in the Malay Archipelago.

Batangas, tn of Luzon, Philippine Is., cap. of the Batangas prov., and 58 m. S. of Manila. A well-built tn, it was founded in 1581, and contains a palace, the residence of the alcade. It has a considerable trade in native produce with Manila. There is fishing. The prov. itself is mountainous in character. The pop. of the prov. is about 510,224; of the tn, 59,582.

Batara, name given by D'Azara to the bush shrikes which form the genus *Thamnophtus*. They come from S. and central America, and belong to the family Formicariidae. The males are usually black above, whitish-brown beneath, and in length do not exceed 13 in. *T. naevius* has a rounded and comparatively short tail; *T. vigorosus* has a large reddish crest, blackish at the apex.

Batatas, see IPOMOEA.

Batavi, race of Germans, mentioned by Tacitus as a branch of the Chatti, a Ger. tribe. They inhabited the land between the Rhine, Waal, and the Maas, called the Insula Batavorum.

Batavia: 1. See JAKARTA.

2. Cap. of Genesee co., New York, U.S.A., situated on Tonawanda Creek, about 30 m. WSW. of Rochester. It manufs. farm implements, shoes, paper, and metal products. The state institute for the blind is situated here. Pop. 17,800.

Batavian Republic, name by which the Netherlands were known from May 1795 till June 1806, i.e. from the conquest of the country by the French till the appointment of Louis Bonaparte as King of Holland.

Batchian, Bathanian, or Bachan, is. of Indonesia; one of the Ternate group of the Molucca Archipelago, SW. of Halmahera Is.; chief port, Labuha. Area 900 sq. m. It is mountainous and fertile, but is only inhabited on the coast.

Bateman, John Frederic La Trobe- (1810-89), civil engineer, b. near Halifax. His life work was the construction of reservoirs and waterworks. It was his suggestion that Manchester should obtain its water supply from Lake Thirlmere, and Glasgow from Loch Katrine. He also superintended the construction of the waterworks of many other large towns, and was responsible for the water schemes of Buenos Aires, Naples, and Constantinople.

Bateman, Kate Josephine (1842-1917), Amer. actress, b. Baltimore, daughter of Hezekiah B. (see BATEMAN, SIDNEY). Her first appearance on the stage was at the age of 4, in *The Babes in the Wood*; later she played chiefly in Shakespearean and classical drama, with her father as her manager. She acted at the St James's Theatre, London, in *Richard III* in 1851, and in other leading parts until 1909. From 1892 she conducted a school of acting. She d. in London.

Bateman, Sidney Frances (1823-81), actress and dramatist, *née* Cowell, brought up in Ohio, where her family had settled. She became the wife of Hezekiah B. (1812-75), Amer. theatrical manager, and coming to London in 1870 assisted her husband in managing the Lyceum Theatre until 1875; later she managed the Sadler's Wells Theatre. Her 2 most popular plays were *Self*, a comedy, and a tragedy, *Geraldine*.

Bateman, William (c. 1298-1355), Bishop of Norwich, founder of Trinity Hall, Cambridge. Pope Benedict XII appointed him Dean of Lincoln, 1340. During the wars in France he undertook diplomatic negotiations between Edward III and the Fr. king, 1348-54. In 1344 he succeeded Antony Bek as Bishop of Norwich, and was consecrated by the Pope at Avignon.

Bates, Harry (1850-99), sculptor, b. Stevenage, Herts. Having won the travelling scholarship of £200 at the Academy Schools, he went to Paris in 1883 to study under Rodin. In 1892 he was elected A.R.A. 'Love and Life' is considered his masterpiece.

Bates, Henry Walter (1825-92), naturalist and explorer, b. Leicester. His father was a manufacturing hosier, and his son entered the business, but in 1844 he met Alfred Russel Wallace, and in 1848 they sailed together in a trading vessel to Pará. They had practically no money, but hoped to sell their collections when made. B. was 11 years in the country, made his way up the Amazon for 1400 m., and discovered 8000 new species of insects. In a paper which he read to the Linnean Society on the insect fauna of the Amazon valley, he stated and solved the problem of mimicry. His best-known work is *The Naturalist on the Amazons*, 1863.

Bates, Herbert Ernest (1905-), novelist, b. Rushden, Northants. Educ. at Kettering Grammar School, he began life as a journalist, and pub. his first novel, *The Two Sisters*, at the age of 20. Since then have followed a number of novels, in which various aspects of country life are depicted with a sensitive touch. They include *Catherine Foster*, 1929, *Charlotte's*

Row, 1931, *The Fallow Land*, 1932, *The Poacher*, 1935, *A House of Women*, 1936, *Fair Stood the Wind for France*, 1944, *The Purple Plain*, 1947, *The Jacaranda Tree*, 1949, *The Feast of July*, 1954, and *The Sleepless Moon*, 1956. He is particularly successful as a writer of short stories, collections of which include *Day's End*, 1928, *Seven Tales and Alexander*, 1929, *The Woman Who Had Imagination*, 1934, *Cut and Come Again*, 1935, *The Flying Goat*, 1939, *My Uncle Silas*, 1940, and *The Bride Comes to Evensford*, 1949. *The Day of Glory*, 1945, is a play, and *The Country Heart*, 1949, a travel book. He served in the R.A.F. in the Second World War, and his experience was the source of his poignant stories of service life, originally pub. under the pseudonym 'Flying-Officer X.'

Bates, Joshua (1788-1864), Amer. financier, b. Weymouth, Massachusetts. Sent to London in 1816 to take charge of business for Gray & Son; met the Baringes, and formed a partnership with John Baring; B. eventually became senior partner of Baring Bros. & Co. During the Civil war he used his influence against the Confederate States.

Bates, Katherine Lee (1859-1929), Amer. scholar and poetess, b. Falmouth, Massachusetts. She was educ. at Wellesley College where, after a period of study at Oxford, she was prof. of Eng. literature from 1891 to 1925. She is best known for her poem 'America the Beautiful,' which has been suggested for adoption as the U.S. national anthem. Her *Selected Poems* appeared in 1930.

Bateson, Mary (1865-1906), historian, b. Robin Hood's Bay; daughter of a fellow of St John's College, Cambridge. Educ. at Newnham, of which she became a fellow. Her main interest was the study of the hist. of the Middle Ages, especially that of the constitutional and legal problems offered by the hist. of municipalities and bor. customs. Among her contributions of most importance were 'Laws of Breteuil' in the *English Historical Review*, 1900, and *Bale's Index Britanniae Scriptorum*, 1902 (in collaboration with W. B. L. Poole).

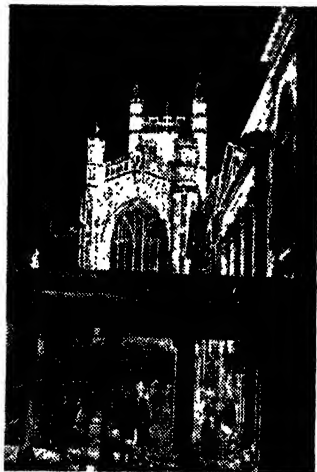
Bateson, William (1861-1926), biologist, b. Whitby. Educ. at Rugby School and St John's College, Cambridge, he was early attracted to biological studies. He became Silliman lecturer at Yale in 1907; prof. of biology at Cambridge, 1908-9; director of John Innes Horticult. Institution at Merton Park, Surrey, 1910; Fullerian prof. of physiology, Royal Institution, 1912-14; president of the Brit. Association for Advancement of Science, Australia, 1914; trustee of Brit. Museum, 1922. In addition to his various papers on biological subjects, he pub. books entitled *Materials for the Study of Variation*, 1894; *Mendel's Principles of Heredity*, 1902; *Problems of Genetics*, 1913.

Bates's Case (or the Case of Impositions), famous case in Eng. constitutional hist., which came before the court of exchequer in 1606. In that year James I directed the collectors of customs to demand a duty of 5s. per cwt on imported currants, in

addition to the 2s. 6d. granted by the Statute of Tonnage and Poundage. John Bates, a merchant of the Levant Co., refused to pay the additional duty, on the ground that it had not been granted by Parliament; but a unanimous decision of the 4 barons of the court of exchequer, under Chief Baron Fleming, was soon given for the Crown on process against him by information. The decision, which created a dangerous precedent, was entirely subversive of liberty, but, apart from the fact that in those days judges could be dismissed at the royal pleasure, Eng. constitutional law had not reached that stage of development which later, under Coke and Hale, estab. for all time what is known as the 'rule of law.' See 2 State Trials, 371; S. R. Gardiner, *History of England* (i. 449), 1883-94; *State Papers, Domestic*, xlviii. 109, 116, xlix. 10; and i. 1.

Bath: 1. City, municipal co., and parlor of Somerset, England, situated in the valley of the Avon, 107 m. W. of London. B. is built in a natural amphitheatre, and as the character of its buildings and streets corresponds with the beauty of its situation, it has an appearance equalled by no other Eng. city. These advantages, and especially the therapeutic efficacy of its medicinal spring, have long made B. the resort of fashion. The houses of B. are all built of the white freestone known as B. stone (q.v.). The numerous and handsome public buildings of B. include the assembly rooms, the pump-room, the city markets, and the guild hall. The abbey church is one of the finest specimens of Perpendicular Gothic architecture. The present building was begun in the reign of Henry VII, the original foundation dating back to 775. The Rom. Catholic priory church is a handsome building with a spire 200 ft high. B. has many parks and numerous open spaces, many educational estab., a museum, theatre, hotels, etc. The radioactive springs are beneficial in gout, rheumatism, cutaneous diseases, etc. Half a million gallons flow every day from the hot springs of B., the only natural hot springs in Britain and the richest in radium emanation. Their temperatures range from 117° to 120° F. The great Rom. bath occupied a hall 110 ft by 68. The Royal Baths were opened by the Earl of Ypres in 1916, the B. St wing in 1919, the Old Royal Baths, entirely reconstructed, in 1927. All the baths belong to the corporation, and full details will be found in *The Book of Bath*, issued by it. B. is of great antiquity; it was called Aquae Sulis by the Romans. Magnificent remains of the Rom. baths exist. Richard I granted the town its earliest existing charter, confirmed by Henry III and extended by George III. B. was most famous in the days of 'Beau' Nash, M.C. from 1704 to 1761. The follies and vices of the city have frequently been commemorated by Fielding, Smollett, Anstey, etc. B. is, with Wells, the seat of a diocese, returned two members to Parliament from 1295 to 1918 and now returns one. The city suffered severely from air-raids during the Second World War,

particularly in the so-called 'Baedeker raids' in April 1942. Over 200 buildings of architectural or historic value were either destroyed or seriously damaged, including the assembly rooms. The ancient windows of the abbey were also smashed. Pop. 80,000. See F. Harrison, *The City of Bath*, 1924; C. M. Spender and E. M. Thompson, *Bath*, 1922; G. Home and E. A. Foord, *Bristol, Bath, and Malmesbury*, 1925; E. Sitwell, *Bath*, 1932; B. Little, *The Building of Bath*, 47-1947; 1948; Walter Ison, *The Georgian Buildings of Bath*, 1948.



P.A.-Reuter

THE WEST FRONT OF BATH ABBEY

On the right is the pump-room.

2. Co. seat of Sagadahoc co., Maine, U.S.A., on the W. bank of the Kennebec R., 36 m. N.E. of Portland. It has a good harbour, and shipbuilding is the prin. industry. Other manufs. are iron, brass, and lumber, and there is a trade in ice, coal, and iron and steel. Pop. 10,644. **Bath**, in its original sense, is the plunging of the body into water, fresh or salt, hot or cold, but the meaning is now extended to the application of some unusual substance to the body or the alteration of the enveloping atmosphere. The institution of bathing is of E. origin, and among many oriental peoples was a religious rite. It was practised among Jews, Buddhists, and Muslims, and prevailed among the Greeks at an early period, and was subsequently valued by the Romans. The spread of the custom came through the Romans, who never formed any colony throughout the Old World without building B.s. These were often magnificent structures and closely resembled in number of chambers and uses the modern Turkish B.; they were

used as lounges by the Romans, who resorted to them daily for rest and recreation. In England to-day the Turkish B. is popular on account of its stimulating influence on the system, but many other forms of bathing are common. In the Turkish B. the bather passes from one warm-air room to another until he perspires from every pore, then undergoes a shampoo, ending with being sprayed with warm water, steadily decreasing in heat until it runs cold. Hot-air B.s may also be impregnated with such substances as sulphur or eucalyptus; brine B.s are common in some places; electric B.s are water B.s into which currents of electricity are introduced; mineral B.s are common in spas all over Europe. See BALNEOLOGY.

Bath, Knights of the, Brit. order of knighthood, whose origin is uncertain, though it is traditionally attributed to Henry IV, who bestowed the order on 46 knights on the day of his coronation. It was allowed to lapse from the time of Charles II until the reign of George I, when it was revived, and the number limited to the king and 37 knight-companions. It was formally instituted in 1815, and in 1847 it was extended to civilians. The order now consists of 3 classes: the members of the first class are knights of grand cross (G.C.B.); those of the second class knights commanders (K.C.B.); and those of the third class companions (C.B.). Each of the classes is subdivided into military, civil, and honorary members. The dean of Westminster is dean of the order. The ribbon of the order is crimson, and the badge a gold-white cross (military), gold oval (civil); the motto is 'Tria juncta in uno.' The 2 first classes also wear a star.

Bath-brick, name given to the cakes of siliceous sand used for scouring vessels, cleaning knives, etc. These cakes are made from the sand of the R. Parrett, and manu. at Bridgwater, in Somerset.

Bath Stone, name of a species of oolitic limestone, so called because it is found near Bath. It is used for building. When quarried it is soft, but though it becomes hard on exposure to the air, it is not very durable.

Bathgate, burgh and mkt tn of W. Lothian, Scotland, 6 m. S. of Linlithgow. Coal and shale are found in the neighbourhood, and there are iron and steel foundries, and spade and shovel manu. Pop. 11,300.

Bathometer, or **Bathymeter**, name applied to an instrument used in deep-sea sounding.

Báthori, or **Battori**, name of a famous Hungarian family, members of which ruled Transylvania and Hungary.

Stephen B. (1532-86) was a distinguished soldier. He was elected to the sovereignty of Transylvania in 1571, on the death of John Sigismund Zápolya, nephew of the King of Poland. In 1575 he was elected to succeed Henry of Valois on the Polish throne, was crowned at Cracow in 1576, and conducted a successful war against the Tatar of Muscovy. Stephen's nephew, **Sigismund B.** (d. 1613),

became prince of Transylvania in 1581. He freed the land from Turkish rule, but subsequently resigned his dominions to the Emperor Rudolf II. He later changed his mind, but failed to recover his position. **Elisabeth B.** (d. 1614), niece of Stephen, and wife of Count Nadassy of Hungary, is notorious as a type of inhuman cruelty. The rumours current that she used to murder young girls to bathe in their blood were shown to have some foundation in 1610, when it was discovered she had killed over 600 girls. She was shut up in Csaf fortress in 1610, where she d. For the connection of this case with the 'werewolf' tales, see the *Book of Were-Wolves* by S. Baring-Gould, 1865.

Bathos, see ANTICLIMAX.

Baths, Science of, see BALNEOLOGY and BALNEOTHERAPEUTICS.

Bathsheba, wife of Uriah and mother of Solomon. King David, seeing her one day bathing in a court, made her his mistress and, to conceal his guilt, sent Uriah, with a letter commanding his destruction, to Joab, who was besieging Rabbath Ammon. He then wedded B., but God punished him by the death of his child (2 Sam. xi-xii).

Bathurst, Allen, Earl of (1684-1775), politician, b. Westminster, and educ. Trinity College, Oxford. He entered Parliament in 1705. He was a Tory, and an opponent of Walpole, and was created Earl B. in 1772. B. was a friend of Pope, Swift, and Addison. **Henry**, his son (1714-94), was made Lord Chancellor, 1771, with the title of Baron Apsley; he resigned in 1778.

Bathurst: 1. Prin. tn of the central tableland dist. of N. S. Wales, Australia, on the S. bank of the Macquarie R., 150 m. W. of Sydney. It is the centre of a mixed agric. and pastoral dist. Pop. 16,390.

2. Cap. of the Brit. colony and protectorate of Gambia, W. Africa, on a marshy ls. at the mouth of the Gambia R. Pop. (1957) 19,602.

3. Tn in New Brunswick, Canada, at the end of Nepesiguit Bay. The chief industry at present (1956) is pulp and paper, but important mineral discoveries have been made in the vicinity, making B. a boom town. Pop. 4453.

Bathurst Island, one of the Parry Is. of N. Australia, 120 m. W. of Port Essington. It lies between Cornwallis Is. on the E. and Melville Is. on the W. Discovered by Capt. Parry in 1819. Length about 30 m. It is partly covered with forests and partly unproductive. It is an aboriginal reserve and has the largest mission station in the ter. This was founded by Father (later Bishop) Geell of the Sacred Heart Order in 1911.

Bathyal Deposits, sediments laid down on the sea bed on the continental slope and around certain oceanic ls. B. D. form at depths of from 500 to 12,000 ft and consist typically of green, black, and blue muds. See OCEANOGRAPHY.

Bathybius (Gk *bathus*, deep; *bios*, life), name applied to a slimy mass discovered in great depths of the ocean and first

described by Huxley in 1868. *B. haackelii* was supposed then to be a new organic mass. *Proto-bathybius* was the name given by Dr Beesels in an Arctic expedition of 1876 to a similar substance found in Smith's Sound. The *Challenger* expedition of 1872-6 disproved the theories of Huxley and Haackel, showing *B.* to be caused by the addition of alcohol to the sulphate of lime in the sea-water.

Bathycles, anct Gk sculptor, of Magnesia on the Maeander in Lydia. He is thought to have lived in the 6th cent. B.C. *B.* was the artist who made the throne of the Amyclaeon Apollo at Amyclae, near Sparta.

Bathymeter, see BATHOMETER.

Batignolles, Les, dist. in the NW. of Paris, a former tn joined to the city in 1860.

Batik (Malay *bátik*), process for colouring fabrics, originating among the Dutch E.-Indian natives, and subsequently used in Europe for velvet, velours, and similar fabrics. The design is covered with melted wax, and the uncovered portions dyed, the wax then being dissolved in boiling water.

Batista, y Zaldívar Fulencio (b. 1901), Cuban president since 1933. As an army sergeant he led in that year a successful rising against the former President Machado.

Batiste, material made of fine linen or cotton lawn; in France the term is applied to cambric. The inventor of the material was a certain Baptiste of Cambrai.

Batley, municipal bor. (since 1868) of Yorks (W. Riding), England, 8 m. SSW. of Leeds, the H.Q. of the heavy woollen trade with manufs. of pilot cloths, worsteds, druggets, shoddy, etc. At Birstall (included in the bor. in 1937) is Oakwell Hall (15th to 18th cents.), the original 'Fieldhead' of Charlotte Brontë's novel *Shirley*, preserved as a typical Yorks manor house. Pop. 40,200.

Batman, John (1800-40), reputed founder of Victoria, was a settler in Van Diemen's Land. He formed a company to colonise Port Phillip, and proceeded thither in 1835. He obtained from the aborigines a tract of 600,000 ac., including the present site of Melbourne, but on returning home his title to the land was declared invalid.

Batman (Fr. *bât*, pack-saddle), term used in the Brit. Army for the soldier-groom or servant of an officer, originally the man who was in charge of a but-horse, or baggage animal.

Batna, fort. tn in Algeria, on the Biskra railway, 65 m. SSW. of Constantine. It is near the splendid cedar forests of Mt Tugurt. Altitude 3471 ft. Pop. 17,000.

Batn-el-Hajar (womb of rocks), dist. of the Nile valley of Nubia. It stretches for a distance of about 95 m., and has many lofty granite hills.

Baton (Fr. *bâton*, a stick), short staff or club. The name is applied to sev. articles. The short staff presented to every Brit. field marshal by the sovereign, as the symbol of authority, is known as a *B.* The long staff which is carried by the

drum-major of an infantry regiment is also so called, as is the truncheon of a policeman. As a musical term, the *B.* is the thin stick which is used by the conductor of an orchestra or choir to conduct the performance. *B.* (boston, baton, or batun) sinister is a term used in heraldry to indicate illegitimacy. It is a dimin. of the bend sinister, being one-fourth of its width, and does not extend right across the shield. It came into use in England in the 15th cent. to mark the illegitimate descendants of the royal family.

Baton Rouge, cap. of Louisiana, U.S.A., on the l. b. of the Mississippi. It is situated on a high bluff, and has the state univ., an arsenal, and a penitentiary. On 5 Aug. 1862 the Confederate forces under Gen. Breckenridge suffered a heavy defeat here. Pop. 125,600.

Batoni, Pompeo Girolamo (1708-87), It. painter, b. Lucca. His father was a goldsmith. He estab. himself in Rome, where he studied Raphael and the antique. In a few years he became a figure in Rome, painting miniatures, copies, and doing some work for Rom. churches, and lived there until his death, for 40 years, without a rival, with the exception of Mengs (q.v.). *B.* was extremely popular, from c. 1760, with visitors to Rome as a portrait-painter.

Batou Khan (d. 1254), Mongol emperor, grandson of Genghis Khan, ruled over Russia and Bulgaria. He laid waste Hungary, and in 1252 acquired Moscow.

Batrachia (Gk *batracheios*, frog-like), term that is frequently used synonymously with the class Amphibia, i.e. frogs, toads, newts, salamanders, etc., and sometimes with the order Anura, which consists of frogs and toads alone.

Batrachomyomachia (Gk *Batrachos*, frog; *mys*, mouse; *mache*, battle), Gk poem consisting of 294 hexameter verses. It is a parody on the *Iliad* of quite uncertain date, though it has been attributed by Plutarch and Suidas to Pigras of Halicarnassus.

Batsford, Bradley Thomas (1821-1904), publisher, b. Hertford. At the age of 16 he was apprenticed to his cousin Henry Bickers, bookseller of Leicester Square, London. In 1843 he opened his own bookshop in High Holborn, dealing first in general and medical books, and later specialising in architecture and engineering. He began publishing in 1874 and, joined by his 3 sons, Bradley, Henry, and Herbert, built up a reputation for well-produced books on architecture, topography, and social life; a tradition which has been maintained by his grandson and great-grandson to the present day.

Batshian, see BATCHIAN.

Batta (Kannarese *bhatta*, rice in the husk), extra money added to the pay of a Brit. officer in India. It varied according to place and circumstances.

Battalion, tactical and administrative unit of command in a military force. In the Brit. army only infantry and parachute troops are now organised in *B.s.* The strength of an infantry *B.* is about 1000 officers and men and consists of a

B.H.Q., and H.Q. company, 4 rifle companies, and a support company. The parachute B. is organised on a similar basis. In general the term is also used to signify the unit commanded by a major, but in the Brit. Army a B. is commanded by a lieutenant-colonel.

Battam, see **BATANG**.

Battambang, prov. of Cambodia ceded to Fr. Indo-China by Thailand in 1907. It was returned to Thailand by Japan in Dec. 1941, and again ceded to Fr. Indo-China after the Second World War. B. produces large quantities of high-grade rice.

Battas, **Batacks**, or **Batahs**, race of people which inhabits the central highlands of Sumatra, Indonesia, from the volcano Ophir northwards as far as Achi. Their national centre is Lake Toba. The B. are akin to the Malay race; they till the soil, and grow rice and maize; they also keep cattle, horses, goats, and pigs. Their prin. occupation consists in the manuf. of ironwork, earthenware, and cloth. The people are distinguished by their unwillingness to give up old customs. They are of middle height and light brown in colour, with long black hair. Some are pagan; others were converted to Christianity by Protestant missionaries. Slavery, cannibalism, and other barbarous customs and the endless civil wars among the B. were largely suppressed by the Dutch Gov., which from 1910 until the attainment of Indonesian independence ruled the whole of the tribes. Peaceful as a rule, the B. have no lack of courage on occasion. They have also a written language and literature. See D. Réal, *The Batiks of Java*, 1924.

Batten, commercial term for a piece of square-sawn softwood timber 2 in. to 4 in. thick and 5 in. to 8 in. wide, inclusive. The term is also applied to narrow wooden strips used in shipbuilding.

Battenberg, name of family of Ger. descent, now known as **Mountbatten** (q.v.). The seat of the family was near B., a small place in the Prussian prov. of Hesse-Nassau. In 1851 Alexander, the younger son of Louis II of Hesse, marriedmorganatically the Polish Countess Julia Theresa von Hauke, who was then created Countess of B. In 1858 she was given the rank of princess, and her children were permitted to call themselves Princes and Princesses of B. The eldest son of the marriage, Louis Alexander, was b. in 1854. In 1884 he married Princess Victoria, daughter of Louis IV of Hesse and of Princess Alice, daughter of Queen Victoria (see **MILFORD HAVEN**, **MARQUESS OF**). He d. in 1921, leaving 2 sons, George Louis Mountbatten (1892-1938), Earl of Medina and (second Marquess of Milford Haven, and Louis, first Earl Mountbatten (q.v.). The second son of Julia, Countess of B., was Alexander Joseph, who was prince of Bulgaria, 1879-86, and d. in 1893. The third son, Henry Maurice (1858-96), married Beatrice, youngest daughter of Queen Victoria, in 1885. He had 3 sons and a daughter, Victoria Eugénie, who married

King Alfonso XIII of Spain in 1906. The fourth son of the Countess of B., Francis Joseph, was b. in 1861, and married the daughter of Nicolas I of Montenegro in 1897. The only daughter of the Countess of B. was Marie Caroline, who was b. in 1852 and married Gustavus Ernest, Prince of Erbach-Schönberg, in 1871. The children of Princess Louis and Henry adopted the surname of Mountbatten in 1917.

Batter, in architecture: the inward tilt or inclination of a wall from the base upwards. The purpose is either to increase the strength at the base, as in retaining walls, or to add to the defensive strength of the wall of a fortress; or, occasionally, as an optical refinement, as in the Cenotaph in London. The B. of walls and pylons (q.v.) in Egyptian temples is probably a superfluous trans. into stone of building methods in mud, when walls were battered to increase stability.

Battering-ram, military engine employed in ancient times to cause a breach in the walls of a besieged place. Two kinds of B.s were used, one kind being suspended in a frame, the other movable on wheels or rollers. The ram consisted of a large beam, or spar, with a massive metal head; it was usually set in motion by means of cords passing over pulleys. A roof or screen generally protected those employing it. B.s were often made of great weight and size.

Battersea, Cyril Flower, 1st Baron (1843-1907), politician, b. at Streatham and educ. at Harrow and Trinity College, Cambridge. He entered Parliament in 1880, representing first Brecknock, 1880-1885, and afterwards S. Beds, 1885-92. He was junior lord of the Treasury under Gladstone, in 1892, and was created a peer in the same year.

Battersea (the name means 'Beadurio's island'), parl. and metropolitan bor. of London, on the S. bank of the Thames, facing Chelsea and the S. of Westminster. The manor of B. once belonged to Westminster Abbey. It was originally a marshy area, later given to market gardening, and industrialisation followed the development of railways. Huguenot silk weavers settled there after the revocation of the Edict of Nantes (1685). B. Park (185 ac.) was opened in 1853; the Festival Gardens were opened there in 1951. B. Polytechnic occupies part of the site of the former Albert Palace (1885-8). Many factories, foundries, and engineering works are in the bor., and also the B. Power Station, one of the largest in Europe. Old B. House, built in 1699, contains a collection of De Morgan pictures, pottery and period furniture. The bor. includes parts of Clapham and Wandsworth commons; it returns 2 members to Parliament. Area 2163 ac.; pop. 114,300.

Battery, see **ARMY AND ARTILLERY**.

Battery, see **ASSAULT**.

Battery, Electric, see **ACCUMULATOR**.

Batthyányi, name of a Hungarian family, which traces its descent to the 9th cent. It numbered among its

members some of the most illustrious men of Hungary. In 1526 Francis B. distinguished himself in the battle of Mohács, and Balthazar B. in the Turkish wars of the same cent. Count Casimir B. (1806-54) was minister of foreign affairs in Hungary during the insurrection of 1848-9. After the disaster of Vilayos he fled with Kossuth into Turkish ter., and afterwards went to Paris. Count Louis B. (1809-49), b. Pressburg, entered the army but subsequently adopted a diplomatic career. He was a moderate Nationalist, distrusting Kossuth's extremism, and was Prime Minister of Hungary Mar.-July 1848. Despite his moderation, he was arrested by the Austrians in Jan. 1849, condemned to be hanged but eventually shot.

Battidae, Cyrenaean dynasty of 8 kings. They were: Battus I, who led a colony from Thera (c. 631 bc) to Africa by command of the Delphic oracle, and founded Cyrene; Arcesilaus I (590-574); Battus II (574-c. 560); Arcesilaus II (c. 560-550); Battus III (550-530); Arcesilaus III (530-510); Battus IV (of whom nothing is known); and Arcesilaus IV (d. about 450 bc). The last-named is the subject of 2 of Pindar's odes. The hist. of the dynasty may be found chiefly in Herodotus.

Battistini, Mattia (Barone di Poggio Casolino) (1858-1928), lt. singer known by the title 'La Gloria d'Italia.' His debut in 1878 at the Teatro Argentina in Rome brought him an engagement immediately for the lt. opera in Buenos Aires. Thereafter he toured in all the prin. tns of S. America and Europe and attained fame as one of the greatest dramatic baritones in the world. B. created many important roles, and his friend Massenet rewrote for him the tenor part in *Werther*.

Battle, mrkt tn and par. of Sussex, England, 7 m. NW. of Hastings. The great abbey, St Martin's, was founded by William I to commemorate his victory in 1066. It stood on a bare ridge above the hamlet of Santlacho (Senlac). The impressive gateway and other substantial parts of the abbey remain, and also the Abbot's House, enlarged after the Reformation, in which Elizabeth I lived in Mary's reign. This is now a girls' boarding-school. Industries include jam-making and metal working; B. is the agric. and administrative centre of a large rural dist. Pop. 4250.

Battle, fight between armed forces, whether large or small, on land, sea, or in the air. A B. is termed general when both armies are brought fully into action; if only a considerable portion of each it is partial. A commander may choose to act on the offensive or defensive, or to combine both, according to circumstances; judgment in decision, skill in preparing the plan of B., and promptness in varying it as required are the marks of a great leader. See articles on individual B.s and FIRST and SECOND WORLD WARS.

Battle, Wager of, see TRIAL BY COMBAT. **Battle-axe**, weapon which has been in use from primitive times. The head was

originally made of stone, then of bronze, and finally of iron or steel; some varieties could be held with one hand, while others required two. The pole-axe, or halberd, is merely a B. with a long handle.

Battle Creek, city in Michigan, U.S.A., on the Kalamazoo R., 45 m. SW. of Lansing. A health resort and farm trade centre, it has a well-known sanatorium and manufs. cereal and health foods, steam pumps, printing presses, and farm equipment. The Kellogg Bird Sanctuary is near. Pop. 48,700.



THE BATTLEMENTED TOWER OF SWANSEA CASTLE

Battle Honours, devices or distinctions employed to memorialise outstanding episodes in the hist. of an army or a regiment. These devices take various forms, the commonest being the emblazoning of the names of battles or campaigns on regimental colours. Other forms are the granting of special badges, mottoes, and titles (such as 'Royal'), distinctive items of uniform (such as the bearskin of the Scots Greys, and the back-badge of the Gloucestershire Regiment). The custom is derived from the grant of 'augmentations of honour' to a knight's coat-of-arms in the Middle Ages. In the Brit. Army all B. H. are granted by the sovereign, and are pub. in Army Orders, and recorded in the Army List, at the head of each regimental list. In the U.S.A. names of battles are not placed upon the colours, but are emblazoned upon streamers attached to the colour-pike, just below the head. In the Brit. Army, Royal Artillery units commemorate some particular episode in their subtitles, e.g. '25th Medium Battery (Battle Axe Company)', whose forerunners were a company of artillery which served with distinction at the capture of Martinique in 1809, and was presented with a battle-axe, which it still possesses. The 1st Foot Guards were granted the title of Grenadier Guards to commemorate their service at Waterloo. The 3rd Hussars

were allowed an extra drum-horse to carry some drums captured from the French at Dettingen; the 2nd Gurkhas (Brit. Army) carry a 'truncheon' to commemorate their service at the siege of Delhi during the Indian mutiny. It is a practice in most armies to decorate the regimental colours with medals, etc., but this is not permitted in the Brit. Army. B. H. are also painted upon regimental drums.

Battle of Britain, see BRITAIN, BATTLE OF.

Battledore and **Shuttlecock**, game played 2000 years ago in China, and still popular. It consists in battling the shuttlecock, a cork base surrounded by feathers, with parchment rackets, the game being to keep the shuttlecock in the air as long as possible.

Battleford, tn at the confluence of the Battle and N. Saskatchewan R.s, Canada. From 1876 to 1883 it was the seat of gov. for the NW. Terr., and the first newspaper in the terr., the *Saskatchewan Herald*, was estab. here in 1878. It was the scene of an Indian uprising during the rebellion of 1885. Fort B. National Historic Park, a renovated N.-W. Mounted Police post and museum, was opened in 1948. Pop. 1320.

Battlement (O.F. *bataillement*), wall erected round the top of a fortified building consisting of rising parts known as crenels or merlons, and intervening spaces called crenelles. The soldiers fired from the embrasure while taking refuge behind the merlon. In architecture B.s are still erected for artistic effect.

Battleships, the heaviest class of warship, and the most heavily armoured, now generally considered obsolescent, although they or ships of a similar type may have a future as firing platforms for guided missiles. Armour plate was first used by the French in 1859 after their experience of the power of shore batteries in the Crimean war; but these ironclads, as they were called, were none the less built of wood, covered with 4-in. wrought-iron plates—a tribute to the increasing power of shell-fire. The *Warrior*, of 9000 tons displacement and 4-in. plates, launched in 1860, was England's earliest ironclad. Three years later the ironclad was superseded by the ship with revolving turrets, the *Royal Sovereign* being the first of this type, and its armament was the standard main armament of a battleship for many years. Guns were soon invented, however, which could pierce the armour carried by such vessels as the *Devastation* and others, of which the plate varied from 8 to 12 in., with turrets protected by 14-in. plating; whence later ships had a still greater thickness of armour, and still more powerful guns. The next development was a ship capable of firing in all directions from central batteries and, therefore, not dependent upon broadsides. Most subsequent developments have been due to increase in gun power, and vessels of larger displacements have had to be built to carry the heavy armament. The *Dreadnought*, completed in 1906, is generally held to be the type

from which the modern battleship has been evolved. She was 490 ft in length, of 17,900 tons displacement, had 10 12-in. guns in 5 turrets, was plated with improved resisting substitutes for wrought iron, and was capable of a speed of 21 knots. The Washington Treaty of 1922 limited the size of B. to 35,000 tons and the calibre of their guns to 16-in. The London Treaty of 1936 continued this limitation of size and tried to reduce the maximum calibre to 14-in. Japan did not sign this treaty, with the result that, firstly, the maximum calibre of guns reverted to 16-in. and, secondly, a protocol of June 1938 increased the maximum permitted tonnage to 45,000.

At the outbreak of the Second World War the Brit. Navy had 12 B. and 3 battle-cruisers (capital ships faster and more lightly armoured than B.)—the latter comprising the *Hood*, then the largest battle-cruiser in the world (see HOOD, TMS), having a displacement of 42,000 tons; the *Repulse* (32,000 tons and armed with 15-in. guns), which was sunk by the Japanese in 1942; and the *Renown* of similar tonnage and main armament. Five more B. were then being built, all of 35,000 tons and armed with 14-in. guns. At the end of the war there were 15 B., the additions being *King George V* (1940), *Howe* (1941), *Anson* (1941), *Duke of York* (1941), all 35,000 tons displacement, and armed with 10 14-in. and 16 5.25-in. guns.

The U.S. Navy, as at Jan. 1939, had 15 B., Japan had 10, France 5 B. and 1 battle-cruiser, Italy 4, and Germany 2 B. and 2 battle-cruisers. The U.S. Gov. had then made provision for 6 new B.—2 for completion by 1942, and 4 by 1943; and it was also then decided to build ships of 45,000 tons in future. But this programme was revised during the war and by 1944 America had 23 B. and 2 battle-cruisers. No details were available concerning Japan's intentions at that time. France was a party to the protocol which provided for the limitation of the size of B. to 45,000 tons, but the Fr. Gov. subsequently announced that they would not build ships over 35,000 tons unless other continental powers exceeded that tonnage. The *Richelieu* and *Jean Bart*, both laid down before this decision, are of 35,000 tons, as was the *Clemenceau*, sunk uncompleted in Brest. Italy had 4 B. under construction, all of 35,000 tons and armed with 15-in. guns. Three Ger. B.—*Bismarck*, *Tirpitz*, and another—were building, all of 45,000 tons with 15-in. guns. In 1939 the largest Ger. warships actually in commission were the 26,000-ton *Gneisenau* and the sister ship *Scharnhorst* (q.v.), completed in 1938, officially classified as battle-cruisers. Next to these in size were the 3 so-called pocket B. of the *Deutschland* class, of 10,000 tons displacement, and so lightly armoured that they were really no more than armoured cruisers. (See ADMIRAL GRAF SPEE.)

The *Vanguard*, the most recently built Brit. battleship, was launched on 30 Nov. 1944, and commissioned in Aug. 1946. It

is a 42,500-ton ship, somewhat shorter and broader than the *Hood* (q.v.), with a superstructure rising like a fortress more than 80 ft above the water-line. It has a main armament of 8 15-in. guns, and a secondary armament of 16 5.25-in. guns, besides numerous 6-barrelled and single-barrelled Bofors. It has the latest radar equipment and embraces results of exhaustive research in every other sphere of ship armament and design. Thus the ship incorporates many lessons of the recent war in machinery damage control. A distinctive feature also is the streamlining of the funnels, the result of tests to evolve a design which would prevent the funnel gases from interfering with gunfire. The main power for propulsion and the many intricate services originates in boilers that incorporate a new system of high-efficiency oil-burning. There are on board information rooms where men can study; a cinema, with tiered seating for 200; and even soda fountains. Laundry, cooking, bakery galleys, and the air-conditioning plant are all powered by electricity. The *Vanguard* is now in the Reserve Fleet, as one of the 4 B. of the *King George Class*. The U.S.A. has 13 B., France 2, and the U.S.S.R. 3, but more are included in the operational fleets. See also CRUISER and NAVY AND NAVIES.

Battori, see BATHORI.

Battue (from Fr. *battre*, to beat), method of killing game, such as hares, pheasants, etc., by having them driven out of cover by beaters towards the spots where sportsmen are stationed to fire. In war or civil strife the term has often been applied to the slaughter of helpless crowds.

Batu (Russian often *Batuy*), Mongol-Tatar khán, grandson of Genghis Khan (q.v.). He conquered Russia 1236-40; he defeated the Hungarians and Poles but was repulsed by the Czechs and Austrians. He founded the Golden Horde (q.v.).

Batum, see BATUMI.

Batumi (anc. *Bathys*), port on E. shore of Black Sea, cap., economic and cultural centre of Adzhar (q.v.) Autonomous Rep. It has exports of Baku oil products, citrus fruits, and tea. There is a famous botanical garden (founded 1911). Pop. (1939) 71,000.

Baturin (Ukrainian *Baturyn*), vil., former tn, in Chernigov Oblast of the Ukraine, 63 m. E. of Chernigov, founded in 1575 by Stephen Batory (see BATHORI). In 1669-1708 and 1750-64 it was the residence of the Ukrainian hetmans (q.v.).

Batz, tn in dept of Loire-Inférieure, France, situated on the coast 50 m. NW. of Nantes. B. and the neighbouring vills. are inhabited by a community with own dialect and customs, said to be of Saxon or Scandinavian descent. Pop. 2000.

Batz, is., see BAS.

Bauan, or **Baun**, tn in Batangas prov., Luzon, Philippine Is., at the head of Batangas Bay, 50 m. S. of Manila. It grows coco-nuts, corn, rice, and sugar. There is also fishing. Pop. 40,168.

Baucant, see BEAU SÉANT.

Bauchi, hilly dist. of N. Nigeria, notable for its tin mines which are situated chiefly

on the plateaux. Bauchi is the cap., and other tns are Bukuru, the S. terminus of the railway from Kano, Ngaruga, and Leri.

Baucis, see PHILEMON AND BAUCIS.

Baudelaire, Charles Pierre (1821-67), Fr. poet, b. Paris, son of a civil servant under the First Empire. After his father's death his mother married Col. Aupick. B.'s childhood was unhappy, and there was constant friction between B. and his stepfather. He was educ. at Lyons and Paris, and at the age of 20 was sent on a voyage to India, which was interrupted at Mauritius. Back in Paris he lived on a small patrimony, his difficult circumstances being increased by his relationship with Jeanne Duval, a half-caste who had become his mistress; she was, however, the direct inspiration for some of his greatest poems. He began writing poetry as early as 1841; he pub. art criticism on the Exhibitions of 1845 and 1846 in the *salons*; and he trans. the works of Edgar Allan Poe. His masterpiece, *Les Fleurs du Mal*, was pub. in 1857. It is a unique work in the hist. of 19th-cent. poetry—classical in form, realistic in outlook, and romantic in its fire and rich imagery. Much of the colour and oriental images were probably due to his voyage in the E. After the pub. both B. and the publisher were prosecuted on account of the impropriety of certain poems. But it is clear that B.'s bitter cynicism and painting of debauchery are due to a need for purging himself by self-expression; and thus implicitly there is a spiritual note inherent in the *Fleurs du Mal*. In spite of his prosecution, the work was praised by a number of critics, and since then his fame has steadily grown. His influence on the younger poets, such as Mallarmé and Rimbaud, was immense, and he is now recognised as the greatest of the poets of the later phase of the Fr. Romantic movement. His later works include *Les Paradis artificiels*, 1860, and *Petits poèmes en prose*, 1869. From 1864-6 he lived in Brussels where he fell seriously ill; he was taken back to Paris, and d. there soon after.

Théophile Gautier's life of B. was trans. into English in 1915; also B.'s *Intimate Journals* (trans. by C. Isherwood, 1930); and the *Letters of Charles Baudelaire to his Mother*, 1833-66 (trans. by A. Symons, 1928). See also J. Rivière, *Études*, 1911; G. T. Mines, *The Influence of Baudelaire in France and England*, 1913; R. Vivier, *L'Originalité de Baudelaire*, 1926; P. Quennel, *Baudelaire and the Symbolists*, 1930; E. Starkie, *Baudelaire*, 1933; J. P. Sartre, *Baudelaire* (trans.), 1949; H. Peyre, *Connaissance de Baudelaire*, 1951.

Baudin, Charles (1784-1854), Fr. adm., fought in the Napoleonic wars. In 1838 he distinguished himself by the capture of San Juan de Ulloa (or Uloa).

Baudissin, Wolf Heinrich von (1789-1878), Ger. writer, was for some time secretary to the embassy in Vienna, and later in Paris. Afterwards, however, he gave all his time to the study of literature. He took an active part in the Shakespeare trans. of Tieck and Schlegel, and trans.

also other Elizabethan dramatists, as well as Molière and Goldoni.

Baudouin I (1930-), King of the Belgians, elder son of Leopold III (q.v.) and his first wife, Queen Astrid. During the controversy over his father's conduct during the Second World War B. remained with Leopold in Switzerland. He succeeded to the throne on 17 July 1951, Leopold having abdicated the day before. He is unmarried, the heir-presumptive being his brother, Prince Albert (1934-).

Baudouin, Manuel Achille (1846-1917), Fr. lawyer, b. Tours, advocate general at Lyons, 1880; procurator general at Limoges, 1885; advocate general at the court of cassation in 1880, and president of the civil tribunal of that court 3 years later. Prominent as procurator general in the revision of the Dreyfus trial. In 1913 he became general president of the court of cassation.

Baudrillart, Henri Joseph Léon (1821-1892), Fr. economist, son of Jacques Joseph B. (1774-1832), a writer on forestry. As a member of the Academy of Moral and Political Science he was entrusted with an inquiry, the results of which were pub. in his *Agricultural Population of France*, 1885. He was prof. of political economy at the École des Ponts et Chaussées.

Baudry, Paul Jacques Aimé (1828-86), Fr. painter, b. in Vendée. He won the Prix de Rome in 1850. His subjects were mythological or decorative, but he painted one historical picture ('Charlotte Corday after the death of Marat'). His best work was his mural decorations in the Paris opera house, the château de Chantilly, and the Cour de Cassation. His works are marked by graceful design and rich colouring rather than by strength or originality.

Bauer, Bruno (1809-82), Ger. theologian and historian, b. Eisenberg, Germany, and educ. at Berlin, where he became a licentiate of theology in 1834. In 1839 he moved to Bonn, but within the next 2 years pub. such unorthodox works on the Gospels that his licence to teach was withdrawn, and he retired to Rixdorf to spend the rest of his life in study and authorship. His theories on the origins of the Gospels are, briefly, that Mark was written in the time of Hadrian, and that from this the others were forged a century later by Gentile converts, who passed them off as genuine apostolic documents. B. also wrote hist. of the 18th cent. and the Fr. Revolution.

Bauer, Caroline (1807-77), Ger. actress, b. Heidelberg. She made her début in 1822. In 1829 she was married morganatically to Prince Leopold of Coburg, then widower of the Princess Charlotte and afterwards King of the Belgians. Their union was unhappy, and came to an end in 1830. Returning to the stage for some years, she finally left it in 1844 to marry a Polish count. She wrote 2 vols. of theatrical reminiscences and memoirs.

Bauer, Georg, see AGRICOLA, GEORGIUS.
Bauer, Otto (1881-1938), Austrian Socialist politician. In Nov. 1918 he became foreign minister. In this capacity

he saw the inauguration of the rep.; he resigned, July 1919, and subsequently led the Socialist opposition. Dollfuss's campaign against the social democrats forced him to seek refuge in Czechoslovakia, 1934. He later went to Paris, where he d.

Bauernfeld, Eduard von (1802-90), Austrian dramatist, b. Vienna. His irrepressible humour, and his sense of the ridiculous both in circumstances and character, make him the Molière of the Viennese stage. *Leichtsinns aus Liebe*, 1831, *Bürgerlich und Romantisch*, 1835, *Der kategorische Imperatif*, 1851, and *Moderne Jugend*, 1868, are the best known of his comedies. See W. Zentner, *Studien zur Dramaturgie Bauernfelds*, 1922.

Baugé, tn, cap. of a canton, dept Maine-et-Loire, France, on R. Couanon, 23 m. N.E. of Angers. The French defeated the British under the Duke of Clarence here in 1421. Pop. 3500.

Bauhin, Gaspard (Kaspar Bauhinus) (1550-1624), Swiss botanist, b. Basel. He is said to have held the offices of prof. of Greek, of anatomy and botany, and of the practice of medicine, dean of the faculty of medicine, chief physician to the tn, and rector of the univ. His chief works were *Phytopinz*, Basel, 4to, 1596, and *Prodromus Teatri Botanici*, Frankfurt, 1620. He also made collections of the synonyms of the botanical writers who had preceded him. The latter appeared in his *Pinax Teatri Botanici* in 1623 (2nd ed., 1671), forming a complete key to the botanical knowledge of the day.

Bauhin, Jean (1541-1613), Swiss botanist and physician, b. Basel, brother of Gaspard B. His father (an Amer. Protestant and refugee) placed him with Leonhard Fuchs (q.v.), the famous botanist, and afterwards with Conrad Gesner (q.v.), the great naturalist, whom he accompanied on excursions through Switzerland. He visited sev. other parts of Europe with a view to collecting materials for his *Historia Plantarum*, afterwards pub. In 1566 he settled at Basel, where he was elected prof. of rhetoric.

Bauhinia, genus of tropical Leguminosae named by Linnaeus after the 2 botanists, Bauhin. The leaves are generally divided into twin lobes, but the genus is chiefly remarkable for its twining stems which twist in and out in an intricate manner. *B. variegata* is the ebony wood of India; *B. purpurea* and *B. galpinii* showy shrubs for a cool greenhouse.

Baumann, Oskar (1864-99), Austrian traveller, b. Vienna; in 1885 journeyed with Leng up the Congo R. to Stanley Falls; the following year he explored Fernando Po, and 2 years later ascended the mt of Kilimanjaro. During 1892-3 he led an expedition to Lake Victoria and explored the surrounding dist.; in 1896 he was made consul at Zanzibar. He pub. sev. works on his explorations.

Baumannshöhle, stalactitic cavern in the Harz Mts (q.v.), on the R. Bode, 5 m. S.E. of Blankenburg (q.v.). It contains numerous fossil remains.

Baumbach, Rudolf (1840-1905), Ger. poet and novelist, b. Kranichfeld. Among his best works are the epic, *Zlatorog*, 1877; his book of lyrics, *Lieder eines fahrenden Gesellen*, 1878; and fairy tales, as *Es war einmal*, 1889.

Baume (-les-Messieurs), Fr. vil. in the dept of Jura. There are grottoes with stalactites. Pop. 260.

Baume-les-Dames, Fr. tn in the dept of Doubs, on the Doubs. It had a convent for nuns of noble birth. It manufs. pipes and cloth. Pop. 2900.

Baumgarten, Alexander Gottlieb (1714-1762), Ger. aesthetician, b. Berlin. He studied at Halle, and became a warm admirer of Wolff's philosophy. B. applied himself to logic, on which he afterwards gave lectures at the orphan institution of Halle. He invented the word aesthetics, which he applied to the theory of taste, or the science of the beautiful. He divided the science of aesthetics into theoretical and practical; he developed his ideas first in his treatise *Disputationes de nominalis ad poema pertinentibus*, 1735, and in his *Aesthetica*, 1750. The other works of B. are *Metaphysica*, 1739, *Ethica Philosophica*, 1740, and *Initia Philosophiae Practicae*, 1760. In 1740 B. was appointed prof. of philosophy at Frankfurt-on-the-Oder, where he d.

Baumgarten-Crusius, Ludwig Friedrich Otto (1788-1849), Ger. theologian, b. Merschnurg; studied at Leipzig Univ. From 1812 to 1842 he was prof. of theology at Jena. He was an authority on the hist. of Christian dogma, and his books include *Grundzüge der Biblischen Theologie*, 1828, and *Kompendium der Dogmengeschichte*, pub. 1846.

Baumgärtner, Andreas, Baron von (1793-1865), Austrian scientist and politician, b. Friedberg, Bohemia, and studied at the univ. of Vienna, where he became prof. of physics. He was later minister of commerce and of finance, 1851. He pub. *Die mechanische Theorie der Wärme*, 1864, *Naturlehre*, 1823, and other works.

Baun, see BAUAN.

Baur, Ferdinand Christian (1792-1860), Ger. theologian, b. near Stuttgart. In 1825, while prof. in the theological seminary at Blaubeuren, he pub. his *Symbolik und Mythologie oder die Naturreligion des Altertums*. Next year he became prof. of theology at Tübingen, where he wrote mainly on mythology and allied subjects. *Das manichäische Religionssystem* appeared in 1831; *Apollonius von Tyana* in 1832. Meanwhile he was coming under the influence of Hegel, whose philosophy of hist. he adopted. Between 1835 and 1847 he estab. the Tübingen school, whose teachings were so opposed to orthodox tradition that they aroused antagonism. B. contended that the only genuine epistles of St Paul are Galatians, Corinthians, and Romans, and that these prove him an opponent of Peter. B. also argued in his book on the Gospels (1847) that these were 1st and 2nd cent. adaptations from an earlier gospel, and show a desire to reconcile the opposing factions. His main argument is that Peter tried to establish a

Jewish Christianity, while Paul worked on broader lines, and that their differences influenced Christian literature for 2 cents.

Bautain, Louis Eugène Marie (1796-1867), Fr. theologian, b. Paris, educ. at the Ecole Normale. He became prof. of philosophy and later also of literature at Strasburg. In 1828 he resigned to take orders, but remained in Strasburg until 1849, when he was transferred to Paris as vicar of the diocese, and remained there until his death. He was strongly opposed to rationalism.

Bautzen (anc. Budissin), Ger. tn in the dist. of Dresden, on the Spree (q.v.), 30 m. E. by N. of Dresden (q.v.). Napoleon defeated Blücher (qq.v.) near by in 1813. There is a 15th-cent. cathedral. Textiles, engines, and chemicals are manuf. Pop. 42,000.

Bauxite, earthy compound of aluminum oxide, iron oxide, titanic acid, and water, in varying proportions; found in the S. of France (taking its name from Les Baux, near Arles), in Brit. Guiana (the chief Brit. source of supply), in Ireland (Antrim), and in the U. S. United States. Its colour varies according to the proportion of oxide. B. is valuable for the production of aluminium and its salts, of which it is the chief commercial source. As it resists heat well it is used for making crucibles and fire-bricks. See C. S. Fox, *Bauxite*, 1927, and N. V. S. Knibbs, *The Industrial Uses of Bauxite*, 1928.

Baval, Fr. tn in the dept of Nord, 13 m. SE. of Valenciennes, the anc. Bagacum, cap. of the Nervii. It has ironworks and marble quarries. Pop. 2600.

Bavaria (Ger. *Bayern*), *Land* of SE. Germany, in the Federal Rep., bordered on the N. by the dists. of Suhl, Gera, and Karl-Marx-Stadt (in the Ger. Democratic Rep.); on the E. by Czechoslovakia and Austria; on the S. by Austria; and on the W. by the *Länder* of Baden-Württemberg and Hesse (qq.v.). Until 1918 B. was a kingdom of the Ger. empire, and from 1918 until 1945 was a state of the Ger. Reich; its ter. (total area 29,498 sq. m.) then included also the Rhenish Palatinate (see PALATINATE) on the W. bank of the Rhine, now part of the *Land* of Rhineland-Palatinate (q.v.). The present *Land* of B. is divided into 7 areas, 191 urban and rural dists., and 7127 coms. There are 3 univs. (Munich, Erlangen, and Würzburg, qq.v.), and there is also a technical univ. at Munich. The pop. is (1950) 71.87 per cent Rom. Catholic, 26.5 per cent Protestant, and 0.1 per cent Jewish. Cap. Munich (q.v.). Area 27,000 sq. m.; pop. 9,161,300.

The country is in general a plateau, with minor ranges of mts and wide plains. It is enclosed on the S. by the Alps, on the N. by the Frankenwald, and on the NE. by the Forest of Bohemia (qq.v.). It belongs principally to the basins of the Danube and the Main (qq.v.), and water communications on these rvs. and their tribs. are well developed.

B. is predominantly agric.: the main products are wheat, rye, barley, oats, potatoes, and sugar beet. One-third of

the area of the country is forested (pine, fir), and one-sixth is pasture land on which cattle, horses, sheep, and goats are raised. In industry the prin. occupation is the manuf. of textiles; the brewing industry of B. is famous, and there are also machine-construction, saw-milling and wood-working, engineering, chemical, and motor-car building industries. The chief minerals found in the country are coal, lignite, iron ore, pyrites, salt, and bauxite. Three-quarters of the electricity produced is from hydro-electric installations. B. has 2 artistic festivals which are world famous: the Wagner festival at Bayreuth (q.v.) and the Passion play at Oberammergau (q.v.).

History. The original inhabs. of B. were probably Celtic. Shortly before the Christian era they were conquered by the Romans and included in a Rom. province. After the decline of Rom. power they suffered from the inroads of the Barbarians, and were ultimately conquered by the Franks (q.v.); eventually B. was incorporated in the empire of the Carolingians (q.v.). During the cents. which followed B. was the cause of many disputes between rival princes, until towards the end of the 11th cent. it passed into the hands of the family of Welf (see GUELPHS). The first Welf retained it with difficulty, and passed it on to his sons, but his grandson, holding both B. and Saxony (q.v.), was deprived of B., which passed back into the hands of the imperial family. In 1156, however, it was recovered by Henry the Lion (q.v.). But Henry did not hold the duchy for long; in 1180 he was placed under the imperial ban, and his lands were given to a duke of the Wittelsbach family. Under the early Wittelsbachs B. increased in prosperity, but its means of territorial expansion were declining owing to the growth of neighbouring states. During the 13th and 14th cents. the possibility of B. becoming one of the great Ger. powers was stopped by the div. of the duchy into 2, and again, after a short union, into 6. For some time the hist. of B. is simply the record of the quarrels which were the outcome of these divs. In 1504 the duchy was reunited under Albert the Wise. After his death again a partial div. took place between his sons, William IV and Louis; after Louis's death, in 1545, William IV again ruled over a united B. William IV keenly supported the Catholic Church, and was able to a very great extent to repress the progress of the Reformers. His son followed his policy, and was succeeded by William the Pious, who had been trained by the Jesuits. His son, Maximilian I, placed B. on a strong basis, reformed it internally, took an active part in the Thirty Years War (q.v.) and regained for his country the addition of the Upper Palatinate. He d. in 1651, leaving B. strong and able to take her place in the councils of Europe, a thing which internal strife had forbidden during the past 4 cents. The next reign was taken up in a judicious attempt to allow the duchy to recover from its exhaustion after the

Thirty Years War. Under Maximilian's son this work was carried out, but Maximilian Emmanuel unfortunately sided with France during the Sp. Succession War and shared in the defeat at Blenheim (q.v.) in 1704. His dominions, lost for the time, were only restored in 1714 in a ravaged and exhausted condition. On the death of the Emperor Charles VI, untainted by the experience of 1702-14, Charles Albert devoted all his strength and power to an attempt to win from Maria Theresa the crown of Austria. Semi-successful at first, he d. in the midst



E.N.A.

BAVARIAN PEASANT

of failure (1745), and his successor got back the ancestral possessions only by giving unconditional acknowledgment of the Pragmatic Sanction (q.v.). For a short while B. was again allowed to attempt to recover. And in 1777, on the extinction of the Bavarian line of the Wittelsbachs, the succession passed to the elector palatine (Charles Theodore), and the Palatine and the duchies of Julich and Berg were united to B. This directly led to the war of the Bavarian Succession. The revolutionary wars found B. a prey to the alternate attacks of France and Austria. In 1805, however, B. was made into a kingdom by Napoleon, the title being vested in the ducal elector. B. now remained a firm ally of Napoleon until 1813, when, by a change of sides, it was confirmed by the victorious allies in all the benefits and advantages given it previously by Napoleon. In 1818 Maximilian I presented his people with a constitution, attempting to reconcile the demand for

political freedom with his newly acquired kingly rights. He started political and religious reforms and was a much-loved monarch. He d. in 1825 and was succeeded by his son, Ludwig I (see LOUIS). He made Munich a centre of culture and art, but Parliament opposed the expenditure on art, and this opposition of the Catholic party, the Ultramontanes, was inflamed by the king's love for Lola Montez, a dancer. This led to Ludwig's abdication in 1848 in favour of his son, Maximilian II. For the religious hist. of this period see DÖLLINGER, IGNAZ VON. During the Austrian-Prussian war

the bourgeois Majority Socialists on the other Eisner was forced to call a general election for a Bavarian constituent assembly. On 21 Feb. 1919, while on his way to the assembly, Eisner was assassinated. Chaos ensued, and out of it arose a coalition gov. with Hoffmann, a Majority Socialist, as minister-president. Owing to Communist agitation Hoffmann was forced into retirement, and a Communist Soviet Republic was proclaimed in Munich by Ernst Toller, Landauer, Levine. Hoffmann, however, was supported by Prussian troops. Munich was starved into surrender and on 1 May



BAVARIA

E.N.A.

A monastery in the Ettal near Garmisch-Partenkirchen.

13. helped Austria, and had to pay indemnity to Prussia and concede a small amount of ter. In 1870 it placed its army under the command of the Prussians, and by the treaty of Versailles (1871) became an integral part of the Ger. Empire with certain privileges. Ludwig II, who had succeeded to the throne in 1864, was through his madness forced to abdicate and committed suicide in 1886. His brother Otto, also insane, became king, but Ludwig's uncle, Luitpold, reigned as regent until 1912. This regency marks a period of prosperity until the First World War. Ludwig III had succeeded his father as regent, and on 5 Nov. 1913 was crowned king. On the same day 5 years later a Socialist meeting was held in Munich to protest against the continuance of the war. This was the beginning of the Nov. revolution, and on 8 Nov. 1918 a Soviet Gov. was set up under Kurt Eisner (q.v.). Ludwig III fled the throne and on 13 Nov. abdicated. With the communistic Spartacists on one side and

capitulated. After a week of bloodshed the Hoffmann gov. was restored. Landauer was murdered, Levine court-martialled and shot, and Toller imprisoned. B. now became the centre of conservative reaction, and many of the counter-revolutionaries of the unsuccessful Kapp (q.v.) revolt in Berlin (1920) sought refuge in Munich. Hoffmann was succeeded as minister-president by the bourgeois von Kahr, who, however, resigned in 1921 as a result of a conflict with the allied commission over the disbanding of the citizen guard. Count Lerchenfeld took office, but in 1922 was succeeded by von Knilling. Von Kahr, a man of strong monarchist sympathies, was made general commissioner in 1923, and he planned with Gen. von Lossow, military dictator appointed by the Reich, and with Col. Seisser, chief of police, to establish Bavarian nationalism. This triumvirate broke negotiations with the Reich, but were embarrassed by a movement having similar aims, only without

any monarchist intentions, led by Hitler and Ludendorff (q.v.). Both parties planned a march on Berlin, and Hitler forced Kahr and Lossow to join him. They went back upon their word, but when the Hitler group collapsed from its own indecision Kahr's hopes of a dictatorship were also doomed. Gen. von Seeckt was appointed by the Reich to restore order in B., and he came to an agreement, called the Peace of Homburg, with the Bavarian minister-president, von Knilling. Later von Knilling resigned, and a coalition gov. was formed, of which Dr Held took the lead. His policy was a vigorous assertion of Bavarian rights, while remaining, however, within the Ger. Federation. After Hitler's accession to power the fortunes of B. were merged with those of Germany as a whole. During the Second World War Augsburg, Munich, and other towns were heavily bombed by the R.A.F., and eventually B. was conquered by the Amer. Third Army under Gen. Patton (q.v.), which entered Regensburg in Mar. 1945. After the war B. was administered as part of the Amer. and Fr. zones of occupation. See WESTERN FRONT IN SECOND WORLD WAR.

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Bavarian Forest, see BOHEMIA, FOREST OF.

Bawean, or **Bawan**, Island, Indonesian is. situated in the Java Sea between Borneo and Java; hilly, with fertile valleys and hot springs. Pop. 30,000.

Bawtry, tn and par. of Yorks (W. Riding), England, 9 m. SE. of Doncaster on the extreme S. boundary of the co. The first house coming in from London and the S. is known as 'Number One, Yorkshire.' Pop. 1500.

Bax, Sir Arnold Edward Trevor- (1883-1953), composer, b. London. He studied composition and pianoforte at the Royal Academy of Music. He never held any official teaching appointment, but in 1941 was appointed Master of the King's Music. His work, influenced slightly by the Russian school at first and owing much to Ireland and the Celtic revival, has been described as neo-romantic. He wrote a great deal in almost every musical form, including film music for *Oliver Twist*, the carol *Mater ora Filium* for double choir, 7 symphonies, the symphonic poems *The Garden of Fand*, *Tintagel*, and *November Woods*, various solo works with orchestras, much chamber music, and numerous piano works and songs. Oxford Univ. awarded him the degree of D.Mus. in 1934 and Durham Univ. in 1935. He was knighted in 1937. His vol. of memoirs, *Farewell, My Youth*, was pub. in 1943.

Bax, Clifford (1886-), dramatist and poet, b. London. He studied painting at the Slade, and lived abroad for some years until, abandoning painting, he turned to literature and drama. His first play to be produced was *The Poetasters of Ispahan*, 1912. Among subsequent productions were *Polly*, 1923, *Midsummer Madness*, 1924, *Mr Pepys*, 1926, *The Venetian* and *The Immortal Lady*, 1931, *The Rose without a Thorn*, 1932, and *The House of Borgia*, 1935. His numerous publs. include, in addition to plays, *Inland Far* (memoirs), 1925, a monograph on Leonardo da Vinci, 1932, his collected poems, *My Muse*, 1932, *Evenings in Albany*, 1942, a novel, *Time with a Gift of Tears*, 1943, and *Some I Knew Well* (remembrances), 1951.

Bax, Ernest Belfort (1854-1926), journalist and philosopher, b. Leamington. He studied philosophy in Germany, where he acted as a foreign correspondent during 1880 and 1881. In 1885 he was the co-founder with Wm Morris of the Socialist League, and for a time assisted in the editing of the *Commonweal*. He later joined the Social Democratic Federation, and became the editor of its organ, *Justice*. His works on historical and socialistic subjects include *Ethics of Socialism*, 1889. His vol. of *Reminiscences and Reflections* appeared in 1918.

Baxar, see BUXAR.

Baxter, Richard (1615-91), clergyman, b. Rowton in Shropshire. Educ. at Ludlow by Richard Wicksstead, he studied for the ministry at Wroxeter, and was ordained in 1638. After a period as headmaster of Dudley Grammar School and a curacy at Bridgnorth he went as preacher to Kidderminster, the scene of his famous ministry. While siding with the Parliamentarians in the Civil war (he accepted a chaplaincy to the Parl. army), he was a supporter of the constitutional principle of the authority of 'King-in-Parliament,' and opposed the execution of the king. He held a middle course between the Episcopallians and Presbyterians and was an advocate of 'moderate Episcopacy.' On the restoration of the monarchy he was appointed one of the king's chaplains and was twice offered a bishopric. He presented to the conference at the Savoy a reformed liturgy. On the passing of the Act of Uniformity of 1662, he was the first to give the lead to the 'ejected 2000,' and was later the first to suffer imprisonment. His brutal treatment and trial by Judge Jefferies have been immortalised by Macaulay. He retired to Acton, but after the indulgence of 1672 he returned to London. He wrote *The Saints' Everlasting Rest*, 1650, and sev. other religious works, and left an autobiography, *Reliquiae Baxterianae*—a favourite work with Johnson and Coleridge. This has been abridged and ed. by J. M. Lloyd Thomas as *The Autobiography of Richard Baxter*, 1925. Orme prefixed a life to his ed. of B.'s works in 23 vols., 1830; lives by Dean Boyle, 1883, and F. J. Powicke (2 vols.), 1924 and 1927. See I. Morgan, *Nonconformity of Richard Baxter*, 1946.

Baxter, William (1650-1723), Eng. philologist, nephew of Richard B., b. Shropshire. Pub. an ed. of Horace and a *Glossarium Antiquitatum Britannicarum*.

Bay (Fr. *bayer*, to gape), name given to an inlet of the sea that is wider towards the open sea and narrower as it advances into the mainland. The term is often used where gulf would be more appropriate, a gulf being deeper and less variable in width than a B. In theory the character of B.s or gulfs as territorial or free is a matter of measurement, the material point being the width at the mouth; but by ancient usage certain B.s or gulfs, such as Conception in Newfoundland, Chesapeake, Delaware, and Cape Cod B.s (Amer.), and Cancale (Fr.), have a national character, though far wider than 6 m. at their entrance (6 m. being the conventional limit, as laid down in 1894 by the Institute of International Law for territorial waters generally). Various views have been expressed by jurists, e.g. defensibility from the shore, the range of one cannon shot from shore to shore (or 3 m.), a cannon shot from each shore (or 6 m.), an arbitrary distance of 10 m., and so on, so that obviously there is no agreement and could be none on a question which has become increasingly baffling with the development of aircraft and submarines.



Bay, name chiefly given to *Laurus nobilis*, the Sweet B., an evergreen tree, native to S. Europe, and the victor's laurel of olden times. The aromatic leaves are dried for culinary use, and the berries for veterinary purposes. B.-berry is a name given to *Myrica pensylvanica*, *M. californica*, and *Pimenta acris*, while the Loblolly B. is *Gordonia lasianthus*. The Red B. is *Persea borbontia*.

Bay, in architecture, either (i) a compartment or section in the length of a building, between each pair of roof-trusses and their supporting buttresses, if any; or (ii) a similar div. of a long vaulted building, between the main

transverse arches and buttresses; or (iii) a compartment of the floor of any large modern framed building, between the girders.

Bay City, port, city, and summer resort, cap. of Bay co., Michigan, U.S.A., on the Saginaw R. near Saginaw Bay. It has sugar and oil refineries, a fishing fleet, and manufs. heavy machinery, metal products, chemicals, and cement. Pop. 52,500.

Bay Islands, group of is. off Honduras, discovered by Columbus in 1502. The largest is., Roatan, is 30 m. long by 9 m. broad; others are Guanaja (Bonacca), Utila, etc. They were occupied by Brit. settlers in the 17th cent., but not formally annexed until 1852. In 1859 they were ceded to Honduras. English is still largely used there. Their prin. produce consists of coconuts, bananas, and other fruit, which are exported to the U.S.A. Area 144 sq. m.; pop. 8860.

Bay of Islands, co. of New Zealand on the E. coast of N. Island, named from a bay of irregular coastline on the E. side, containing numerous is., but forming a spacious and safe harbour. Russell is the site of the first missionary settlements and the first centre of gov.

Bay Psalm-Book, first book pub. in the Amer. colonies. It appeared in 1640, under the guidance of Richard Mather, Thomas Welde, and John Eliot, and was a rendering into verse of the Psalms.

Bay Rum, aromatic liquid, obtained by mixing oils of bay with alcohol, water, and oils of pimento and orange peel. It is of value as a perfume and cosmetic.

Bay State, name applied to the state of Massachusetts, U.S.A., which was estab. in 1626-30 as the Massachusetts Bay Colony.

Bay Window, window projecting from the face of a building at ground-level, and either rectangular or polygonal on plan. The name seems to have been given originally to the large window adjoining the dais (q.v.) in a bay (q.v.) of a medieval great-hall. It may be of one or more storeys; but if projecting from an upper floor only and supported on brackets or corbels, it is called an 'oriel'; and if semicircular on plan it is a 'bow window'.

Baya (*Ploceus bayu*), bird of the family Ploceidae or weaver birds (q.v.); common to India and Ceylon.

Bayadère (Portuguese *bailadeira*, female dancer), name given to the trained dancing-girls of India, the nautch girls. Some of the pantomimic dancers are attached to the Hindu temples.

Bayamo, or **San Salvador**, city in Oriente prov., SE. Cuba, on the Bayamo R., founded by Diego Velásquez in 1513 as San Salvador de B. It is a rail junction, and has an airport; a stockraising centre and H.Q. of Cuban dairying. Pop. 16,160.

Bayamón, tn of Puerto Rico, situated in an agric. area inland about 5 m. SSW. of San Juan. It was the cap. of the is. in the 16th cent. It raises sugar, fruit, tobacco, and vegetables, and manufs. leather goods, rayon, and alcohol. Pop. 20,171.

Bayana, tn of Uttar Pradesh, India, a fort and formerly a famous city, the scene of fierce battles between Muslims and Hindus. There are fine ruins of Muslim origin.

Bayan-Khara-ula Mountains, Mongol name of an extensive range in E. Asia. The dist. is unexplored by Europeans, and the existence of these mts was long only known from Chinese geographers, according to whom they lie in the centre of the E. Asian table-land, W. of Lake Koko Nor, between 35° and 38° N. lat. and 96° and 100° E. long. According to the Oxford Atlas they lie due S. of the Koko Nor. The mts rise to 20,000 ft.

Bayard, Pierre du Terrail, Seigneur de, known as 'le bon chevalier, sans peur et sans reproche' (the good knight without fear and without reproach) (c. 1475-1524), Fr. soldier, b. at the château de B. in Dauphiné. He was a page in the household of the Duke of Savoy; in 1494 he accompanied Charles VIII to Italy and distinguished himself at the battle of Fornovo, after which he was knighted; later he served in the It. wars of Louis XII; and was present at the battle of the Spurs, where he was taken prisoner. Francis I was knighted by B. on the field of battle at Marignano, 1515; but B. was mortally wounded when defending Bonniwet against an army of Charles V. Besides being a brilliant soldier, B.'s chivalry was acknowledged by both his friends and enemies. See S. Shellabarger, *The Chevalier Bayard*, New York and London, 1928.

Bayard, Thomas Francis (1828-98), Amer. statesman, b. Wilmington, Delaware. In 1848 he began to study law, and was called to the Bar in 1851; he was a senator, 1869-85, and became secretary of state, 1885-9. He was the leader of the Democratic party in the Senate, and was many times proposed as President. He was U.S. ambas. to Great Britain, 1893-7. See Edward Spencer, *Public Life and Services of Thomas F. Bayard*, 1880.

Bayard, horse of the 4 sons of Aymon; he appears in Tasso's *Rinaldo*, Ariosto's *Orlando Furioso*, and Bolardo's *Orlando Innamorato*; the name is also given to a horse in Scott's *Lady of the Lake*, and is frequently applied to any spirited horse.

Bayazid I and II, see BAJAZET.

Baybay, tn on the W. coast of Leyte, Philippine Is., 40 m. direct SW. from Tacloban, the cap. of the prov.; pop. 50,725.

Bayberry, name given to N. Amer. species of *Myrica*, family Myricaceae; including *M. cerifera*, the evergreen shrub whose fruits are covered with a wax used for fragrant candles; *M. californica*, the Californian B., also evergreen; and *M. pensylvanica*, a deciduous shrub. *Pimenta acris*, family Myrtaceae, is the aromatic B. Black Cinnamon or Wild Clove of the tropics.

Bayer, Gottlieb (Theophil) Siegfried (1894-1738), Ger. Orientalist and historian, b. Königsberg; studied Syriac, Coptic, Chinese, Mongolian, and Tibetan. Member of the newly founded Academy

in St Petersburg and Prof. of Classical Antiquities in 1726. In Petersburg he pub. his main works: *Museum sinicum*, 1730; *Historia Oshroëna et Edepena*, 1734; *Historia regni Graecorum Bactriani*, 1738.

Bayer, Johann (1572-1625), Ger. astronomer, b. Rhain in Bavaria, followed the profession of a lawyer at Augsburg. In 1603 he pub. a chart of the stars, *Uranometria*, in which he included 12 new constellations of the S. hemisphere, and employed letters of the Gk alphabet in star nomenclature. His S. constellations are said to have been derived from the observations of a Dutch navigator.

Bayern, see BAVARIA.

Bayessa, see BAEZA.

Bayeux, Fr. tn in the dept of Calvados, on the Aure, 17 m. NW. of Caen. It is on the site of the Rom. *Augustodurum*, and has a bishopric dating from the 4th cent. It was taken by Rollo (see under NORMEN) in 890, was pillaged by Henry I of England in 1106, and was under siege many times in the Hundred Years War and the religious wars of the 16th cent. The splendid cathedral is mainly 12th-13th cent. The famous tapestry is preserved in the museum (see BAYEUX TAPESTRY). B. was the first tn liberated by the Allies in 1944 (see under WESTERN FRONT IN SECOND WORLD WAR, INVASION OF NORMANDY), and has a large Brit. war cemetery, in which a memorial (dedicated in 1955) to those whose graves are unknown, bears, in Latin, the inscription: 'We whom he conquered have set free the land of William the Conqueror.' Charter (q.v.) was b. in B. There is an agric. market, and lace and pottery are made. Pop. 10,300.



FLOWER

BAYBERRY

Bayeux Tapestry, roll of linen 20 in. wide and 231 ft long, preserved in the anct bishop's palace of Bayeux, Normandy, upon which are worked in coloured woollen thread the events connected with the invasion and conquest of England. It is not, strictly speaking, tapestry, as it is worked in sampler fashion. The work is divided into 72 compartments,

with descriptions in Latin, and the crude colours still retain their freshness. Various conjectures as to its origin have been made, tradition assigning it to Matilda, wife of William the Conqueror; it was more probably worked for his half-brother, Odo, Bishop of Bayeux, a view which gains support from the fact that 3 of Odo's followers mentioned in Domesday Book (q.v.) are among the very few named figures in the tapestry. It was first mentioned in the 14th cent., when an inventory was made of the goods in Bayeux Cathedral, which it adorned. In 1724 a drawing of a portion of it was presented to M. Lancelot, a member of the Académie des Inscriptions, and this led

Holy Sea'), freshwater lake in S. Siberia stretching from SW. to NE. in a mountainous region (1513 ft above sea level). Length 390 m.; breadth 20-50 m.; area 12,500 sq. m. It is the deepest lake in the world, its greatest depth being 5660 ft. Lake B. has many rivs. flowing into it, the main one being the Selenga, and only one outlet, the Angara; it is rich in fish and there are also seals.

Baykalean Mountains, sev. ranges enclosing Lake Baykal in SE. Siberia. They stretch in a NE. direction. The highest peak (Shebetuy in the Barguzin range) is 8380 ft. There are gold, tin, mica, and coal deposits. See also TRANSBAYKALIA; YABLONOVYY.



BAYEUX TAPESTRY
Panel showing the death of Harold.

to public knowledge of the work. In 1803 it was sent to Paris by order of Napoleon for a short inspection, but was shortly after returned, and in 1816 Charles Stothard was sent by the Eng. Society of Antiquaries to make an accurate copy of it. His drawings of it were pub. in the sixth vol. of *Vetus Monumenta* in 1819. During the Second World War the tapestry was placed in safe keeping, first in Bayeux and later in a château near Le Mans. After the allied invasion of Normandy the tapestry was taken to Paris by the Germans and placed in a basement in the Louvre, from which it was recovered intact in Aug. 1944. See Jules Comte's *Tapissierie de Bayeux*, 1878; Rev. J. C. Bruce's *Bayeux Tapestry Elucidated*, 1855; F. R. Fowkes's *Bayeux Tapestry*, 1898; E. MacLagan, *The Bayeux Tapestry*, 1943; F. Stenton (ed.), *The Bayeux Tapestry*, 1957.

Bayf, Jean Antoine de, see Balf, JEAN ANTOINE DE.

Bayida, or Bahinda, Steppe, desert of Nubia, the Sudan, in the bend of the Nile, N. of Khartoum, which contains sev. rocky mts and sparse vegetation.

Baykal (Mongolian Dalai-nor, 'The

Bayle, Gaspard Laurent (1774-1816), Fr. physician, b. Vernot, Provence. He studied at the École de Médecine, Paris, and was M.D. in 1801. His reputation rests on his intensive study of pulmonary tuberculosis, summarised in his book *Recherches sur la Phthisie Pulmonaire*, 1810 (Eng. trans. 1815). He himself d. of the disease, a victim of his own zeal for work.

Bayle, Pierre (1647-1706), Fr. critic and philosophical writer, b. Carlat-la-Comte. He was the son of a Calvinist minister, and was brought up in this faith, but while at the Jesuit College of Toulouse, he made a profession of the Rom. Catholic faith, which he revoked less than 2 years later. For this reason he withdrew, in 1670, to Geneva to study, and 5 years later he was appointed to the chair of philosophy at the Protestant univ. of Sedan. When this univ. was suppressed by Louis XIV in 1681, he became prof. of philosophy at Rotterdam. He lost his professorship in 1693 as a result of controversy, and devoted himself to the compilation of his great dictionary, the first vol. of which under the title *Dictionnaire historique et critique* appeared in 1695, completed in

1697. The uniqueness of this work, its grace of style, the erudition and learned scepticism which it displayed, enhanced his reputation, already considerable, and a second ed. appeared in 1702. There have been many subsequent eds., notably that by P. des Maizeaux, Amsterdam, 1740, to which a life of B. was added. Among B.'s earlier works were controversial writings on theology, his *Pensées sur la comète*, 1682, and particularly the *Nouvelles de la république des lettres*, 1684-7, a species of periodical which he pub. over a number of years, devoted to literary criticism. Voltaire called him 'le premier des dialecticiens et des philosophes sceptiques.' See H. E. Smith, *The Literary Criticism of Pierre Bayle*, 1912; H. Robinson, *Bayle the Sceptic*, 1931.

Baylén, see BAILÉN.

Baylis, Lillian Mary (1874-1937), theatrical manager. She was associated with the introduction in 1914 of Shakespeare's plays as a permanent programme at the Old Vic Theatre, London, of which she was lessee and manager from 1898. She also leased the Sadler's Wells Theatre when it was rebuilt and reopened in 1931. Her productions here of opera in English alternated with those of Shakespeare at the Old Vic. She began her career as a child violinist, and as such played both in Great Britain and in S. Africa. C.II., Hon. LL.D.

Bayliss, Sir William Maddock (1866-1924), physiologist, b. Wolverhampton. Early studied medicine, but did not complete his studies, preferring research work, which he did under Ray Lankester and Burdon Sanderson at Univ. College, London, from 1881. Resumed medical work, studying physiology under Sanderson and later under Schäfer. It was the scientific rather than the clinical side that appealed to him, and he resolved to abandon medical qualification and confine himself to physiology. Took natural science and physiology at Oxford, and after obtaining his degree resumed work under Schäfer at Univ. College, and applied himself to research with John Rose Bradford, notably in the electrical phenomena accompanying secretion. Soon after this he began research work at Guy's Hospital in the electrical phenomena of the heart and the action of the nerves on the heart and, later, carried out important research work on the vasomotor nerves (also with Bradford). As prof. of general physiology at Univ. College (1912-24) he took part in the teaching there. Collaborated with E. H. Starling (q.v.) in the study of internal secretions. Wrote numerous papers dealing with physico-chemical problems of physiological importance, and also on the action of enzymes. His *Principles of General Physiology* (1915) is a work of outstanding significance, and reveals a catholicity of study besides a profound knowledge of its prin. topic. In 1911 he was awarded the royal medal of the Royal Society and in 1922 the Copley medal; he was knighted in 1922.

Bayliss, Sir Wyke (1835-1906), painter, b. Madeley; studied at the Royal Academy. He became president of the Royal

Society of Brit. Art, 1888, and was knighted in 1897. He specialised in interior views of cathedrals and churches.

Baylor University, founded by Baptists of Texas in 1845, has been at Waco since 1887. In addition to the college of arts and sciences it has colleges of dentistry (Dallas) and medicine (Houston), and schools of law, education, music, nursing, and business. Its libraries had a total of 208,000 vols. in 1956, including a famous Robert Browning collection of 13,000 items. In 1955 there was a teaching staff of 235, with 5800 students.

Bayly, Ada Ellen, see LYALL, EDNA.

Bayly, Thomas Haynes (1797-1839), song-writer and dramatist, b. Bath. He was educ. at Winchester and Oxford and was best known for his sentimental songs, such as 'I'd be a Butterfly,' 'Oh! no! we never mention her,' 'The Pilot,' and 'Gaily the Troubadour.' His most successful play was *Perfection*, and he also pub. 5 novels.

Bayne, Alexander (d. 1737), jurist, first prof. of law in Scotland. Became an advocate at the Scottish Bar, 1714; in 1722, prof. of Scots law at Edinburgh; ed. and wrote sev. works on Scots law.

Bayne, Peter (1830-96), Scottish author. He graduated at Marischal College, Aberdeen, and studied theology for the ministry at Edinburgh. He became editor of the *Edinburgh Witness*, 1856; the *Dial*, 1860-2; and of the organ of the Eng. Presbyterian Church, the *Weekly Review*. He wrote the *Testimony of Christ to Christianity*, 1862; and a *Life of Luther*, 1887.

Baynes, Thomas Spencer (1823-87), writer and editor, b. Wellington, Somerset, son of a Baptist minister. He was sent to Edinburgh Univ., where he was a pupil, and afterwards assistant, of Sir Wm Hamilton. In 1850 he became editor of the *Edinburgh Guardian*, and in 1858 was appointed assistant editor of the *Daily News*. Six years later he became prof. of logic, metaphysics, and Eng. literature at St Andrews Univ., a post which he held till his death. From 1873 to 1881 he was sole editor of the ninth ed. of the *Encyc. Brit.* His *Shakespeare Studies* were pub. with a memoir in 1894.

Bayonet, name of a short spear-like weapon of varying lengths. When not in use it is carried in a scabbard; when in use it is fixed to the muzzle of the rifle, and forms the thrusting weapon of the infantry in close combat. The original weapon is thought to have been invented at Bayonne in the 17th cent.; it was triangular in section, and had a tapering point. See C. Boulkes, *Sword, Lance and Bayonet*, 1938.

Bayonne: 1. Fr. tn, the anct Lapurdum, cap. of an arron., in the dept of Basses-Pyrénées, at the confluence of the Adour and the Nive, 3 m. from the sea. An anct fort. tn, it is the chief port of the Basque country. The city has Rom. walls, a citadel by Vauban (q.v.), good quays and promenades, and a cathedral which is partly 13th cent. It is the seat of a bishopric. Once renowned for swords and knives (see BAYONET), it to-day has

distilling, ham-curing, and leather industries, and is a tourist centre. Pop. 32,600.

2. City of Hudson co., New Jersey, U.S.A., on 3-m. peninsula S. of Jersey City between Newark and New York bays. A 1675-ft bridge connects with Staten Is. across the Kill Van Kull. B. has large oil refineries connected by pipeline to the oil-fields of the SW. U.S.A.; it has sev. m. of waterfront with docks and U.S. Navy dry-dock and supply depots. It manufs. chemicals, paints, clothing, machinery, textiles, food products, cottonseed oil, cork, radiators, motors, generators, etc. It has a junior college. Pop. 77,200.

Pop. 59,000. See A. Bahr-Mildenburg, *Bayreuth and the Wagner Theatre*, 1913.

Bays, Queen's, see DRAGOON; GUARDS REGIMENT.

Bayse, see BALSE.

Bayswater, dist. of London N. of Hyde Park and Kensington Gardens, in the bor. of Paddington. It derives its name from 'the watering place of Baynard'; a Robert Baynard was knight of the shire here in 1327. The part of B. nearest Marble Arch is sometimes called Tyburnia because of its proximity originally to the Tyburn gallows.

Baytown, see ROBIN HOOD'S BAY.

Baza (anct *Basil*), Sp. tn in the prov. of



Breitkopf & Härtel

THE THEATRE, BAYREUTH

The stage is set for the Grail scene in *Parsifal*.

Bayou (Fr. *bayau*, channel), term originally applied in some of the S. states of N. America to a branch of a riv. or lake, but now sometimes loosely applied to streams of various descriptions.

Bayreuth, Ger. city in the *Land* of Bavaria (q.v.), on the Red Main (q.v.), 122 m. N. of Munich (q.v.). It is famous for its connection with Wagner (q.v.), and a yearly festival of Wagnerian opera is held in the theatre, the *Festspielhaus*, which the composer himself designed. There is also another, baroque, opera-house (1748), and there are fine old churches and a notable 18th-cent. castle, now a museum. The *Eremitage*, a rococo castle, was often visited by Frederick the Great (q.v.), whose sister was margravine of B. Wagner is buried in the garden of his former villa, and in the tn cemetery are buried Liszt, Johann Paul Richter, and Houston Stewart Chamberlain (qq.v.). There are textile and other manufs., and there is a trade in agric. produce and fruit.

Granada, with a Moorish fortress, and a fine Gothic church, which was formerly a cathedral. There are troglodytic dwellings near by. Lead, iron, and cinnabar are mined. Pop. 21,500.

Bazaar (Persian *bazar*, market), oriental name for a covered market, where various objects are exposed for sale. In the W. the term has been extended to shops which sell fancy goods, and to sales of fancy articles which are contributed gratuitously for charitable or religious purposes.

Bazaine, François Achille (1811-88), marshal of France, entered the army as a private soldier in 1831, served in Algeria, and in 4 years became lieutenant, with the cross of the Legion of Honour. In 1839 he was a captain, and a few years later brigadier-general. He distinguished himself in the Crimean War and was made governor of Sebastopol on its capture. Gaining fresh laurels in Italy (1859) he was appointed to a command

in the Mexican expedition. Here, however, he was accused of mixing up political and personal aims with his generalship, and on returning to France in 1867 was coolly received by Napoleon III. In 1870, at the outbreak of the Franco-Ger. war, he was appointed to command the 3rd Corps, and afterwards the whole army of the Rhine. He has been blamed for the defeat of Spicheren, when he allowed Gen. Frossard to be beaten unsupported. B. retreated with his army to Metz, where the Prussians hemmed him in. MacMahon's attempt to relieve Metz ended at Sedan. Then came a series of obscure negotiations by B., which have never been fully explained, but which ended in his surrendering with 140,000 men; setting his besiegers free just in time to crush the great effort then made to relieve Paris. In 1873, after B.'s return from captivity in Prussia, he was court-martialled for dereliction of duty, and condemned to degradation and death, but the sentence was commuted to 20 years' seclusion. Being imprisoned in the Ile Sainte-Marguerite, he escaped thence in 1874. Fourteen years later he d. in exile at Madrid. See R. Peyron, *Le Cas de Bazaine*, Paris, 1905; P. Guedalla, *The Two Marshals*, 1943; R. Christophe, *La Vie tragique du Maréchal Bazaine*, 1948.

Bazalgette, Sir Joseph William (1819-1891), civil engineer, b. Enfield, Middlesex. He became chief engineer to the London Metropolitan Board of Works (1855-89); he superintended the construction of the London drainage system, 1858-75; and the Thames embankment, 1862-74. He was knighted in 1874.

Bazard, Amand (1791-1832), Fr. socialist, b. Paris. He became a civil servant. About 1820 he organised a secret society modelled on the It. Carbonari, but a premature outbreak upset their plans and sent its leaders into hiding. Subsequently, B. adopted the ideas of Saint-Simon which he and Enfantin propagated in various forms, and in the *Doctrine Saint-Simonienne* (1829-30). Later they quarrelled, and B. d. a few months later after an apoplectic seizure.

Bazargic, see TOLBUKHIN.

Bazarjic, see TOLBUKHIN.

Bazas, Fr. tn in the dept of Gironde, on the Beuve. It is the seat of a bishopric. There is a trade in wine and market-garden produce. Pop. 4300.

Bazeilles, Fr. vil. in the dept of Ardennes, near Sedan. It was destroyed during the Franco-Ger. war (q.v.). The house where the last cartridge of the war was fired is preserved as a museum. Pop. 1000.

Bazin, René François Nicolas Marie (1853-1932), Fr. writer, b. Angers; he studied law at the univ. of Paris, and was appointed to the professorship of law at Angers in 1878; he was elected to the Fr. Academy in 1904. His novels deal with provincial life, and he also pub. books of criticism and travel. The following may be noted: *Stéphanelle* (his first novel), 1884; *Une Tache d'encre*, 1888; *Sicile*, 1892; *Humble Amour*, 1894; *Terre d'Espagne*, 1896; *La Terre qui meurt*,

1899; *Les Oberlé*, 1901; *Le Blé qui lève*, 1907.

Bazooche, see BASOCHE.

Baztán, or **Bastian**, valley in the Pyrenees to the N. of Pamplona in Spain. It produces Indian corn, wheat, pulse, and flax, has meadows and forests, and is drained by the R. Bidassoa (q.v.).

'B.C.O.N.', see ARMY NEWS SERVICES.

Bdellium, gum-resin obtained from some species of *Commiphora*. B. is similar to myrrh and is sometimes found adulterating it.

Beach, Sir M. Hicks, see ST ALDWYN.

Beach, Rex Ellingwood (1877-1949), Amer. novelist, b. Atwood, Michigan. He studied law at Chicago, but then turned to mining and finally to writing red-blooded novels of adventure. Among his best are *Pardners*, 1905; *The Spoilers*, 1906; *The Barrier*, 1907; *The Silver Horde*, 1909; *The Iron Trail*, 1913; *The Mating Call*, 1927; and *Money Mad*, 1931. In *Personal Experiences*, 1941, he tells the story of his life.

Beach, Thomas Miller (1841-94), known as Maj. le Caron, spy, b. Colchester. In 1861, at the outbreak of the Amer. Civil War, he went to New York and enlisted with the Federalists. He served till 1865, and then joined the Fenian organisation, supplying the Brit. Gov. with information and remaining in America until 1888. See his *Twenty-Five Years in the Secret Service*, 1892.

Beaches, Raised, terraces near the sea coast which were formerly beaches, but were later raised to constitute dry land. They consist of gravelly, sandy, and shelly deposits. Such B.s are to be found in England and Ireland, but more often in Scotland, many of the coast tns, e.g. Nairn and Cromarty, being built upon them. In S. America they occur in some places at as great a height as 1200 ft above the present sea level.

Beachy Head, cape in England, on the Sussex coast, between Eastbourne and Seaford. Its altitude is about 575 ft, and it forms the termination of the S. Downs. The Bell Tout lighthouse, 285 ft above sea level, erected in 1831, was replaced in 1903 by a lighthouse at the base of the cliff, 125 ft high. The battle of B. II. was fought on 30 June 1890, and won by the Fr. fleet, commanded by the Comte de Tourville, over the allied Eng. and Dutch fleets, under the Earl of Torrington and Count Evertsen. The view from the head in clear weather extends to the Isle of Wight and France.

Beacon (O.E. *béacn*, a sign), originally a fire lighted on a high hill, or tower, for the purpose of sending signals over some long distance, or an alarm or warning. The name has been given to lofty hills, such as Dunkery B., the highest point of Exmoor, and B. Hill, a height N. of Boston Common. Upon these heights the B. fires were formerly lighted, and the towers and cressets are still to be seen. The term B. is now given to any structure used for the warning or guidance of shipping in rvs., estuaries, or the open sea, and may or may not have a light on it, although in terms of the Merchant Shipping Act

(1894) a B. with a light is a lighthouse. One type of Eng. B. is constructed of iron plates, closely fitted together and surmounted by an iron mast, which bears a daymark consisting of a triangle or ball, etc. The B. for a sandbank is an iron tube sunk in the sand, and fitted with a mast to carry the daymark. In some few cases B.s are lighted by gas, a pipe being laid under water and carried up to the lantern, or the gas may be supplied from a tank or cylinders which hold compressed gas for some months. The Monkstone B. in the Bristol Channel is an example of the latter type of lighted B. It is a stone tower ascended by an iron ladder and railed round at the top.

The name is also given to inland lights for aerial navigation and to radio and radar installations for giving direction-finding bearings to ships or landing instructions to aircraft.

Beaconsfield, Benjamin Disraeli, Earl of (1804-81), statesman and man of letters, b. London. He was the son of Isaac D'Israeli, the descendant of a family of Levantine Jews. He was baptised into the Christian Church in 1817, and was educ. privately. At the age of 17 he was articled to a firm of solicitors, and later entered at Lincoln's Inn in 1824, where he kept 9 terms. In 1826 he pub. the first part of *Vivian Grey*, a second part of which appeared in the following year. He left England in 1828 and spent 3 years in the E. During the decade 1830-40 he wrote a number of novels, and pub. sev. political pamphlets. In 1837, on the death of William IV, a general election took place, and he was invited to contest Maidstone, and was returned with Wyndham Lewis as his colleague. In Dec. of the same year he made his first speech in Parliament, and it was on this occasion there occurred the scene when, howled down by the House, he warned the mockers that the day would come when they would hear him. In 1839 he married the widow of his late colleague, Wyndham Lewis. In her he found the sympathy and courage which were to be so necessary an asset in his life. With her fortune he was able to buy an estate at Hughenden.

From the time of his first failure in Parliament he awaited his opportunity, prominent in the House only for the bitterness with which he attacked the Whigs. By 1842 he was known as the leader of the Young England (q.v.) party. But in 1846, by his onslaught against Sir Robert Peel in the Corn Law debates, he became the virtual leader of the Conservative party, though nominally it remained under the leadership of Lord George Bentinck, who, with Disraeli, did much to reorganise and reinvigorate the party machine in the years immediately following 1846. In 1844 had appeared *Coningsby*, in 1845 *Sybil*, and in 1847 *Tancred*, 3 political novels which were intended to explain the origin and the positions and duties of the great political parties. In 1852 he was Chancellor of the Exchequer for a short time; in 1858 he again returned to office, but the 'fancy franchises' drove him and his party out of office for 7 years, during

which he added to his reputation as a debater and a politician. In 1867 he came back into office in the third Derby administration, and then came one of the most striking political incidents, the 'leap in the dark' which 'dished the Whigs.' In that year he introduced a parl. reform Bill more democratic and sweeping than anything which the Liberals had introduced. In the next year he succeeded Lord Derby as the head of the administration, but at the end of the year, not having a majority, he resigned. In 1870 he pub. *Lothair*. In 1874 he began his second administration, an administration notable for its many measures of social reform, as well as for its foreign and Imperial policy;



BENJAMIN DISRAELI
EARL OF BEACONSFIELD

in 1875 he acquired the half rights in the Suez Canal; in the following year he proclaimed Queen Victoria empress of India, and in the same year retired to the House of Lords as Earl of B. In 1878 followed the Congress of Berlin, which raised him to the greatest height of his power, and gave England 'peace with honour.' The wars in Afghanistan and Zululand, together with the commercial depression, gave the opposition their opportunity, and the 'imperial' policy was condemned at the general election of 1880. A large Liberal majority was returned and the Gov. resigned. In the same year appeared the novel *Endymion*, really a book of personal memories. The following year Disraeli d., and was buried at Hughenden, as he had wished.

It is primarily as a statesman that his fame lives, his role as novelist being by way of understudy to the greater part. It is doubtful whether the novels, which are in many ways autobiographical, faithfully reflecting the mystical cynicism of his politics, would survive on their own

merits, though in manipulation of plot and in vividness of characterisation, he showed considerable skill. But the purpose of his novels was always political; his most characteristic novels were *Coningsby* and *Sybil*, and they were powerful because they were ancillary to his political convictions. As a member of the Young England party, he wanted to attack the gov. policy generally as being a break with classic Tory tradition. The lesson he tried to convey was that the Tory govs. from the revolution to the time of the Reform Bill, 1832, were oligarchies which had whittled away the royal prerogatives. *Coningsby*, like *Sybil*, is notable for his championship of the rights of the peasantry, which Disraeli held to have been encroached on by the Poor Law; but *Sybil* went further, and embodied his horror of the misery and squalor of the lives of the working classes in the industrial N., and there is no doubt it was effective propaganda for the cause of factory reform. The 2 novels were a definite expression of the new Tory gospel of the Young England party, which was the assertion of the royal prerogative and the freedom of the Church, and also of the co-equality of the rights of labour and property—which latter doctrine was so eloquently voiced in his famous Chartist speech, alluded to in one of the novels. Finally, *Coningsby* is also a moving plea for the Jewish race. As a writer Disraeli is always informative and interesting, and his style, if mannered and turgid, contains brilliant phrases and shrewd maxims. See lives by J. R. Thurnsfield, 1898, A. Maurois, 1927, and T. Lever, 1942. See also *Letters of Disraeli to Lady Bradford and Lady Chesterfield, 1873-1881*, ed. Marquess of Zetland (2 vols.), 1929, and D. C. Somervell, *Disraeli and Gladstone*, 1925.

Beaconsfield: 1. Residential tn. in Bucks, England. It is 10 m. from Windsor and 23 from London. It is noted as the home of Edmund Waller, the poet, and of Edmund Burke; both are buried here. The Earl of B. took his title from the tn. Pop. 8000.

2. Tn of Tasmania, in an area of apple orchards, with some dairying and general mixed farming, formerly a gold-mining centre.

Bead, in architecture, a small convex moulding.

Bead-tree, *Melia azedarach*, tropical plant cultivated for its flowers, which resemble the lilac.

Beadle (also **Bede**) (A.-S. *byddell*, a summoning officer), official whose function has had many variations. Originally, in Saxon times, he called householders to the moot. After the Conquest he was an officer both of the manor and of the church, but gradually developed into a par. constable. The univ. bedels, once important functionaries, now figure in official processions. At Oxford Univ. there are 4 bedels, the junior being the vice-chancellor's attendant and macebearer. At Cambridge Univ. there are 2 bedels, called esquire bedels, who bear maces before the vice-chancellor. In the Scottish Church the B. attends on the

minister when divine service is being held. See LOCAL GOVERNMENT.

Beads, ornaments which have been used for decoration and barter from remote times, beautiful examples being found in early Egyptian tombs. At the present time they are still the medium of exchange with barbaric tribes. They are made of gold, gems, coral, glass, etc. The manuf. of glass B. in Britain is carried on chiefly at Birmingham; on the Continent Venice is noted for the enormous variety and quantity of B. made there. In the process of manufacturing glass B., the glass is blown into a bulb and drawn out into long tubes. The B. are then pinched or cut off, and heated in cylinders which rotate. To prevent the sticking together of the B. sand and ashes are put into the cylinders. See J. B. Littlejohn, *Beadcraft*, 1930.

Beagle, variety of Eng. hound, used in hare-hunting, there being a good number of packs in Great Britain and Ireland. It has a keen scent, powers of endurance, and intelligence. It is 10-18 in. in height, has long, thin, pendulous ears, a deep chest, and strong widely set shoulders. The coat is thick and flat and of the usual variety of colours of the hound.

'**Beagle**,' H.M.S., name of a brig of 235 tons which, in 1831, was sent by the Brit. Gov. on an expedition, under the command of Capt. Fitzroy, to survey the S. extremity of America. Charles Darwin, as a young man of 22, accompanied the expedition as honorary naturalist on the staff. The voyage lasted from 27 Dec. 1831 to 2 Oct. 1836, and an account of it was pub. by Darwin in 1839 under the title *A Naturalist's Voyage round the World; or, A Journal of Researches into the Natural History and Geology of the Countries visited during the Voyage of H.M.S. 'Beagle.'* Darwin also contributed to the official narrative of the voyage.

Beak, see BILL.

Beak-head Moulding, in Norman architecture, a grotesque ornament, resembling an animal's head with a bird's beak; used in rows around the doorways of churches.

Beaked, heraldic term, followed by a metal or colour, to denote that a bird has a beak of a different tincture from that which it would have according to the normal rules of heraldry.

Beaker (Gk *bikos*, wine-jar), cylindrical or conical vessel made of annealed glass used in chemical operations for making solutions, in analyses, and for various other purposes.

Beaker Folk, widely spread group of peoples with distinctive round-headed skulls who, about 1800 bc, brought the knowledge of metal-working to Europe, and by way of Holland and the Rhineland to Britain. They are so named from a characteristic pot buried with their dead. The B. F. were not themselves metal-workers, and their culture is therefore to be regarded rather as a bridge between those of the Neolithic and the true Bronze Ages; indeed in the E. parts of Britain where the mining and manuf. of flint had long been practised, bronze daggers were

imitated in flint. There are chronological differences between the 2 main varieties of beaker which assist in the definition of 2 separate phases in the settlement of the B. K., but the subject is one of complexity and cannot be considered here. The B. F. were also responsible for the building of simple stone circles with opposed entrances, as at Avebury, Wilts, and Stanton Drew, Somerset, and for other earthwork enclosures some of which contained settings of timber uprights as at Woodhenge (see STONEHENGE). Such circular sanctuaries seem to imply belief in a sun- or sky-god. See J. G. D. Clark, 'The Dual Nature of the Beaker Invasion,' in *Antiquity*, V, 1931, and the same author's *Prehistoric England* (4th ed.), 1952; also Brit. Museum, *Later Antiquities of the British Isles*, 1953. See also ARCHAEOLOGY; BRONZE AGE; PREHISTORY; STONE AGE.

Beal, Samuel (1825-89), scholar, b. Devonport; educ. there and at Cambridge; ordained 1852, and became a naval chaplain on board H.M.S. *Sybil*, which went to the China station. B. spent his spare time in acquiring the language; acted as naval interpreter during the war of 1856-8, and continued his studies after settling in England. His works include *The Travels of Fah-hian and Sung-yun*, 1869; *A Catena of Buddhist Scriptures*, 1871; *The Legend of Sakya Buddha*, 1875; *Texts from the Buddhist Canon*, 1878.

Beale, Dorothea (1831-1906), educationist, daughter of a London doctor. In 1857 she was appointed head of a school for clergymen's daughters, in Westmorland, and in 1858 took charge of the Ladies' College at Cheltenham. She quickly raised the school to very high rank by increasing the number of pupils, reorganising finances, and putting up new buildings. In the report of a commission (1868) before which B. gave evidence, the low average standard of girls' education was exposed. B. felt the absence of trained teachers was perhaps the greatest obstacle to progress. A residential training college for women (the first of its kind in the country) was opened as St Hilda's College, Cheltenham, in 1885. B. subsequently (1893) estab. at Oxford the St Hilda's Hall of Residence for women. Associated with the movement for women's suffrage, she was deeply religious and did much to improve women's education.

Beale, Mary (1632-97), Eng. portrait-painter, *née* Cradock, daughter of a clergyman. She imitated the style of Sir Peter Lely (q.v.), whose pupil she may have been, and painted Charles II, the Duke of Monmouth, Cowley, and Milton. Her son, Charles B. (d. 1689), was also a portrait-painter.

Beale, Robert (1541-1601), Eng. diplomatist and antiquary. He was a Protestant of Puritan inclinations, and became Walsingham's secretary in 1570. He entered Parliament in 1572, and it was he who read Mary Queen of Scots her death warrant. His works include *Discourse after the Massacre of St Bartholomew's*, of which he was an eye-witness;

A Book respecting Ceremonies, the Habits, the Book of Common Prayer, and the Power of Ecclesiastical Courts; and The Order and Manner of the Execution of Mary Queen of Scots.

Beam (from O.E. *beam*, a tree; cf. horn-beam and whitebeam), piece of timber, as a house-B., a weaver's B., etc. The cross-timbers of a ship are her B.s, so that when she heels over she is 'on her B.-ends'; hence the phrase signifying distress or difficulty.

Beam-tree, or White Beam (*Sorbus aria*), species of Rosaceae which grows to a height of 20 to 40 ft in Europe and Asia. The leaves are ovate, with serrated edges, and are white and downy underneath; the flowers grow in terminal corymbs, and the small red fruit resembles a haw. It is acid and astringent, and is sometimes called sorb or service-berry. The wood is used in turning, and beer is made by fermentation of the fruit.

Beam Wireless. For a reliable point-to-point telephone service between 2 widely spaced countries it is necessary to concentrate the energy into a narrow 'beam' of waves. In 1900 Hertz used a parabolical metal reflector. The physical dimensions of the reflecting system must be very large compared with the wave-lengths involved. Unfortunately such small wave-lengths are not suitable for long-distance communication, and the longer wave-lengths involved (10 to 100 metres) would require parabolas of hundreds of ft diameter.

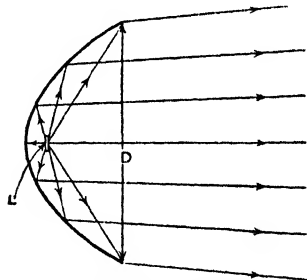


FIG. 1A. PARABOLIC REFLECTOR FOR ULTRA-SHORT WAVE

- L, Aerial length equalling half of wave-length.
D, Diameter of parabola opening.

Another method of obtaining directive properties is to use a number of aerials grouped in an 'array.' The 'dipole aerial,' the physical length of which is half the wave-length being radiated, gives a radiation pattern in the form of 2 main 'lobes,' one on either side of the wire (Fig. 1B). By placing sev. dipoles side by side and 'feeding' all of them in phase, the radiations add up in a line at right angles to the line of dipoles, and subtract at the angles towards the sides. Fig. 1C shows this for 4 dipoles, the main lobes of radiation being about 36 in. wide. This

aerial system is known as a 'broadside' array. It is also possible to feed the dipoles in such a phase as to radiate the maximum energy *in line with the aeriels*; this is known as an 'end-fire' array. By using more dipole elements the beam can be concentrated still further; for example, 16 dipoles suitably arranged would be used to achieve a beam width of about 8 in. This only concentrates the beam in the horizontal plane. To concentrate the

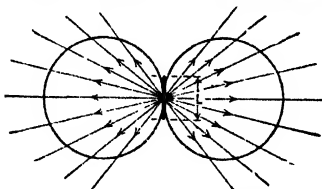


FIG. 1B. RADIATION DIAGRAM OF A DIPOLE

L, Aerial length

beam in the vertical plane, a suitable number of dipoles are stacked one above the other. Since the spacing between dipoles must also be half a wave-length, the number of dipoles that can be stacked in this way is limited. For wave-lengths of about 25 metres 8 dipoles could be accommodated vertically on 500-ft masts, giving a beam width in the vertical plane of approximately 20°. A 24-dipole broadside array is shown in Fig. 1D. It is usual to employ a 'reflector,' consisting of an exactly similar array placed a quarter of a wave-length behind the main aerial. This prevents radiation from one side and increases it on the useful side. About 30 per cent reflection can be achieved in this way. The actual direction of radiation depends on the disposition of the masts supporting the array, and for a comprehensive transmitting service the number of aeriels employed is formidable. An attempt to provide movable masts was made by the Philips Radio Co. at

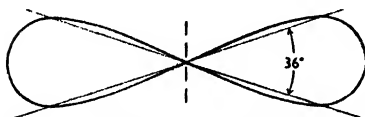


FIG. 1C. CONCENTRATION OF ENERGY BY THE USE OF FOUR DIPOLES

Eindhoven, Holland, where the supporting framework was carried on a circular rail track. Even so, with the multiplicity of wave-lengths that must be used, together with the large number of countries to be served, this device would not give much alleviation in the number of aerial arrays required.

All forms of intelligence may be carried by beam wireless—telegraphic, telephonic, and photographic. In the U.K.

all 3 services are handled by Cable and Wireless Ltd, with the exception of 2-way telephone conversations, which are handled by the G.P.O. Each station comprises 2 units—one for transmitting and one for receiving—usually spaced widely apart in order to obtain the best site conditions. Both sending and receiving stations are connected by land line to the central office of Cable and Wireless Ltd (Electra House, London), which handles all the traffic, both outgoing and incoming. The 2 main transmitting stations are situated at Ongar and Dorchester, with the complementary receiving stations at Brentwood and Somerton respectively. Each station has many transmitters, and a worldwide

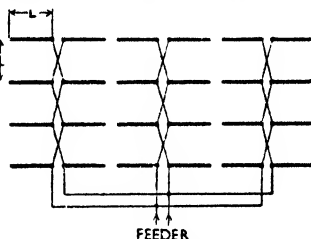


FIG. 1D. 24 DIPOLE BROADSIDE ARRAY

service is maintained at all hours of the day. At some periods it is not possible, through ionospheric conditions, to cover a particular link in 1 direct beam. Therefore automatic wireless relay stations have been installed where the original signal is picked up and re-radiated on a more suitable wave-length and course. An example of this is the London-Montreal service, which can be routed via the relay station installed on Ascension Is. The 2-way telephone service maintained by the G.P.O. employs an exactly similar set-up, the 2 separate conversations being combined at the central office (Faraday House, London), and thence connected in the usual way to any telephone subscriber. See also WIRELESS TELEGRAPHY.

Beaminster, anct mrkt tw and par. of Dorset, 6 m. from Bridport, situated on the Brit. It is mentioned in Domesday Book. Pop. 1800 (approx.); rural dist. 8000.

Bean, name given to the seeds of various plants, chiefly to those of the order Leguminosae. The common or broad B. is *Vicia faba*, and has many varieties. The Fr. or kidney B. is *Phaseolus vulgaris*, and the scarlet runner *P. multiflorus*; both of these plants are grown in England, and the pods are eaten as vegetables. The latter is also used as an ornamental climber. *P. lunatus*, the Lima B., is a native of S. America, with broad flat pods and short flat seeds. *P. mungo*, the mungo B. or green gram, and *P. radiatus*, the black gram, are B.s which are given to horses. *Dolichos biflorus* is

also called the horse gram in India, and is excellent food for cattle, while the pods of *D. lablab*, the lablab B., are cooked for human consumption after the manner of kidney beans. *Glycine soja* yields soya B.s (q.v.). *Ceratonia siliqua* is the Mediterranean species known as the locust or carob B.; *Pigna sinensis* is the cherry B. or cow-pea of tropical Asia; *Mucuna utilis* the tropical velvet B.; *Canavalia ensiformis* the Jack, sword, or sabre B. of India; *Physostigma venenosum* the ordeal B. of Calabar.

Of a few plants which are not leguminous, but whose seeds are known as B.s, may be mentioned *Nelumbo nucifera*, the Egyptian or sacred B. eaten in Cashmere; *Strychnos ignatii*, St Ignatius's B., with poisonous properties; *Menyanthes trifoliata*, the bog or buck B. of Europe, Asia, and N. America. The B. caper is an E. plant, *Zygophyllum fabago*, whose flower buds are eaten as capers.

B.s have value as food on account of the nitrogenous or proteid matter they contain. As forage for horses, cows, sheep, and pigs they have fattening and heat-giving properties. The enemies to which they are subject are 2, fungi and insects. When attacked by fungus the B.s can still be used as rich manure, and if by the B. aphid, or black dolphin, they can often be saved by having their tops cut off. They grow best in warm, light, well-manured soil, and enrich the ground themselves for future use.

Bean-feast, name derived from an old custom prevalent in W. Europe in connection with Twelfth Night festivities. A bean was hidden in a cake, and the person who got the slice containing it was 'king' of the revels. Though the festival was a religious one (the feast of the Epiphany), it was an adaptation from paganism. Originally the king may have reigned for the 12 days from Christmas to Twelfth Night, his chief function being to perform the propitiatory rites to ensure good weather. During the Rom. Saturnalia, said to have been estab. by Tullus Hostilius (c. 650 BC), but probably older, children drew lots with beans to decide who should be king. This was a winter festival, and with alteration of date was christianised into the feast of the Three Kings. See Brand's *Popular Antiquities of Great Britain* (Hazlitt's ed., 1905), under 'Twelfth Night.'

Bean Goose (*Anser fabalis*), species of European wild goose with a short black and red beak, which obtains its name from the resemblance of the upper nail of its bill to a horse bean, or else from the fact that it eats the beans sown in the spring. It is of a grey colour, and breeds largely in the Hebrides.

Bean-king's Festival, see BEAN-FEAST.

Bean-tree, species of 2 genera of Leguminosae which occur in the tropics. *Castanospermum australe*, also known as the Australian chestnut, has edible seeds which resemble chestnuts in flavour when roasted. *Ceratonia siliqua*, the carob- or locust-tree of S. Europe, is the other species.

Bear, widely distributed carnivorous

(often omnivorous) mammals of the family Ursidae and div. Arctoidea. They are large, ungainly animals, with short tails, shaggy fur, plantigrade feet, curved claws which are non-retractile, and broad elongated heads ending in a snout. Their usual method of progression is on all fours, but they are capable of walking upright with a clumsy, shuffling gait, and most of them are climbers. They do not attack man unless provoked, but when roused they are ferocious. Though they sometimes eat flesh, they prefer fruit and honey, and some species are fond of termites, or white ants. Most B.s eat largely during the summer months, and then hibernate, coming out again in the spring in a weak but fierce state. During the



Barnaby's
BEAR CUB

winter months the cubs are born and unless carefully guarded by their watchful mothers they fall a prey to the greed of their fathers. The young are blind at birth and are very small.

The various species have many dissimilar points. The brown B. (*Ursus arctos*) is spread through all the mt. dists. of Europe, from the Arctic circle to the Alps and Pyrenees, and is also found in Asia. It is about 6 ft long and 3 ft high at the shoulders, yet it can easily climb rocks and trees; it can attain the age of 50 years. The fur of this animal is of a yellowish colour in youth. The Amer. black B. (*U. americanus*) is a smaller species than the brown B., of which it is thought to be a variety. It is an object of veneration among the Indians. The grizzly B. (*U. horribilis*) is a native of N. America; it is large, strong, and fierce, has powers of endurance, and is a great hunter. The polar B. (*Thalarchos maritimus*), found in the Arctic regions, is the largest species, attaining a height of 9 ft, and lives on seals and fish. The spectacled B. (*Tremarctos ornatus*) is a smaller species with ringed eyes, found in the Andes; and the sloth B. (*Melursus ursinus*) dwells in mountainous parts of India and lives chiefly on fruits, honey, and termites.

Bear, The Great and Little, see URSA MAJOR and URSA MINOR.

Bear Animalcules, see TARDIGRADA.

Bear-baiting, sport consisting of teasing a tethered bear by setting dogs to bite it or by beating it with sticks. The bear was often blinded beforehand. It was in favour with the ancients, and was popular in England from Norman times down to the 18th cent. Private bear-gardens, or baiting-places, were kept by nobles and gentry, besides those provided by caterers for popular amusement, such as the famous 'Bankside,' where the charges were 'a penny for admission, a penny at the entry of the scaffold (i.e. stage), and a penny for quiet standing.' Mary Tudor and Elizabeth were both fond of witnessing this sport. The Privy Council in 1591 ordered all theatres to be closed every Thursday, because baitings generally took place on that day, and actors could not be allowed to prejudice such entertainments by their competition. Another favourite day was Sunday, which was a further reason for the Puritan interdiction of such sports. B. and bull-baiting were finally banned by Act of Parliament in 1835.

Bear-cat, see PANDA.

Bear Lake, Great, freshwater lake in the NW. of Canada. Its shape is irregular, and it has an area of over 11,000 sq. m. The water is transparent and abounds with fish, especially the so-called herring salmon. It has an outlet in the Great Bear R., which flows into the Mackenzie.

Bear-leader was a term used jestingly of a person who was in charge of a young man of wealth when making a tour of the world, or of one who acted as guide to a celebrity. It arose from the custom of leading about a tame bear, muzzled and on a chain, for entertainment.

Bear River: 1. Rises in N. Placer co., E. central California, and flows about 75 m. SW. and W. to Feather R.

2. In W. Maine, rises in W. Oxford co., flows 12 m. SE. to Androscoggin R.

3. Stream in Utah, Wyoming, and Idaho about 350 m. long, rising in the Uinta Mts and flowing, after a circuitous course through Utah and Idaho, into Great Salt Lake. It is used to irrigate about 50,000 ac. in Utah and Idaho.

Bearberry, Bear's Whortleberry, see ARCTOSTAPHYLOS.

Beard, Charles Austin (1874-1948), Amer. historian, b. Knightstown, Indiana. Educ. at various Amer. univs. and at Oxford Univ. Was prof. of politics at Columbia Univ., 1915-17; adviser to the Institute of Municipal Research, Tokyo, Japan, 1922; adviser to Viscount Goto, Jap. minister of the interior, after the great earthquake of 1923. Among his prin. works are *Introduction to the English Historians*, 1906, *American Government and Politics*, 1910, *Economic Interpretation of the Constitution*, 1913, *Contemporary American History*, 1914, *History of the American People* (with W. C. Bagley), 1918, *History of the United States* (with his wife), 1921, *The Rise of American Civilization* (with his wife), 1927, *America in Midpassage* (with his wife), 1939, *The*

Republic, 1943, *A Basic History of the U.S.*, 1944, and *American Foreign Policy in the Making, 1932-41*, 1946.

Beard, John (c. 1717-91), tenor singer, the finest of his generation in England, both on the stage and in oratorio. Loss of hearing caused his career to come to an end in 1767. Some of Handel's finest tenor parts were composed for B.

Beard, Thomas (d. 1632), divine, educ. at Cambridge. Soon after the acceptance of the rectory of Hengrave, Suffolk, B. became headmaster of Huntingdon hospital and grammar school, where he was Oliver Cromwell's schoolmaster. He wrote *The Theatre of God's Judgements*, which contains an account of Marlowe's death.

Beard, name given to a growth of hair on a man's cheeks and chin. The fashion of the B. varied considerably in various times and countries. Egyptian men were always clean-shaven, and so were young Greeks. Pliny says the Romans did not begin to shave until a.u.c. 454, yet in later times the first day of shaving was considered the entrance to manhood and was kept with festivities. Caesar says that the ancients left the hair long only on the upper lip (see *MOUSTACHE*). The Saxons wore B.s, but the Normans shaved the whole of the face. The sepulchral monuments of kings and nobles show that for many cents. the B. was in fashion, but since the 17th cent. the practice of shaving has become more and more general in Europe and America. The hardships of the Crimean War, when shaving was impossible, resulted in a fashion for long beards which lasted for the rest of the 19th cent. After largely disappearing from the fashion in the early 20th cent., they came back into favour, to some extent, in Europe during and after the Second World War, but are not popular in America. Beards are permitted in the Brit. Navy, but only moustaches in the army.

Beards in south-west Arabia. In SW. Arabia clean-shaven faces that could grow B.s are considered effeminate, and are frowned upon by the tribesmen. According to the Ulema the B. may not be shaved but can be trimmed. Moustache only is rare and considered not unmanly, but to be in imitation of Christians and, as such, indicates a townsman of Lahel or Aden and a bad Muslim. Some seyyids in the Hadhramaut shave the B. This is not approved of by the tribesmen, but the seyyids look upon shaving as a sign of civilisation. To seize a man's B., or even to flick it, is considered a deadly insult. 'God burn his beard' is a frequent exclamation of dislike. The B. is touched or held when swearing by God or as a mark of silent reproof. Trimmings from the B. are carefully concealed, as it is considered that their possession by an enemy, who might burn them, is a grave danger. To kiss the tip of the fingers and then to touch another's B. with them is a mark of supplication and respect. An Arab will describe his B. as his *sherraf* or personal honour. The B. is regarded as a mark of distinction and masculinity.

'Abu Dagan' (father of a chin tuft) is a nickname of respect applied to men with particularly well-grown B.s. The oath 'by the beard of the Prophet' is a powerful one. Frequently, before pronouncing judgment, the B. will be touched, held, or stroked in a contemplatory gesture. An Arab will seize his B. between thumb and forefinger to emphasize his remarks in a quarrel. Beardless youths often imitate the gestures of their bearded seniors, holding invisible B.s, nor is the gesture considered comic.

Beard Grass, species of *Polypogon*, family Gramineae, mostly natives of warmer temperate regions, but the ann. B. G., *P. monspeliensis*, is found in S. England.

Beard Moss (*Fr. barbe de vicillard*) belongs to the genus *Usnea* of lichens. It creeps over stems and branches of trees, hanging down in thick trails, whence its name.



A DECORATION FROM BEARDSLEY'S
'LE MORTE D'ARTHUR'

Beardsley, Aubrey Vincent (1872-98), black-and-white artist, b. Brighton, d. of consumption at Mentone. He worked for various illustrated papers at the age of 20; the following year he illustrated the *Morte d'Arthur*, which at once assured his fame. He was art editor of the *Yellow Book*, but was elbowed out of that position: he joined with Arthur Symons in 1895 to edit the *Savoy*, a rival to the *Yellow Book*. He illustrated *The Rape of the Lock*, Oscar Wilde's *Salomé*, *Mademoiselle de Maupin*, and Ernest Dowson's *Pierrot*

of the Minute. He was at work on initial letters for *Volpone* 3 weeks before he d. His line drawings were delicate and exact, and showed that fastidious elegance that appears even in the most grotesque of his drawings. He worked almost entirely in black and white. See Arthur Symons, *Aubrey Beardsley*, 1898, and *Beardsley Miscellany: Drawings and Designs*, ed. R. A. Walker, 1949.

Beare, Bere, or Beer, common name for the 4-rowed variety of barley (q.v.).

Bearer Securities, in commerce or banking practice, any draft, cheque, bill, note, etc., the presentation for payment of which by the bearer entitles him to receive a certain sum of money. Most B. S. have become negotiable by custom; but to be so negotiable in Great Britain an instrument must be customarily transferable in this country, i.e. cash, by mere delivery. Debenture bonds payable to bearer have by modern usage become negotiable instruments.

Bearing, direction of a line drawn from one point to another, is a term usually employed for the points of the compass: e.g. if the point B is due NW. of A it is said to *bear* NW. of A and its B. is said to be NW. To take B.s is to ascertain the points of the compass on which points lie.

Bearings, see BALL BEARINGS.

Béarn, anc. prov. of France, now included in the dept of Basses-Pyrénées. Its cap. was Pau.

Bear's Breech, name given to the genus of *Acanthus* (q.v.).

Bear's Foot (*Helleborus foetidus*), ever-green Hellebore, family Ranunculaceae, native to Britain and Europe, related to the Christmas rose.

Bear's Whortleberry, see ARCTOSTAPHYLOS.

Beardsen, tn of Dunbartonshire, Scotland, a residential suburb of Glasgow (q.v.).

Beardsted, Marcus Samuel, 1st Viscount (1853-1927), oil magnate. Began in a modest way of business as a representative in Japan for the shipment of oil from Baku to the E. In 1897 he secured capital from the Rothschilds for the purpose of grouping a number of concerns under the style of the Shell Transport and Trading Co., which later became amalgamated with the Royal Dutch Petroleum Co. Was Lord Mayor of London in 1902.

Beas, or Blas, riv. of the E. Punjab, India. It rises in the Himalayas and flows into the Sutlej. The B. and lower Sutlej (in Pakistan) formed the Hyphasis, which marked the farthest progress of Alexander the Great.

Beast, Number of the, see APOCALYPTIC NUMBER.

Beastings, see COLOSTRUM.

Beatenberg, summer health resort situated on the wooded heights to the E. end of the lake of Thun, in the canton of Bern, Switzerland.

Beath, par. of Fifeshire, Scotland, 6 m. NE. of Dunfermline. Coal-mining is carried on. Pop. 22,800.

Beatification, act by which the Pope

permits the limited *cultus* of a 'venerabilis servus Dei,' as of one entitled to be called 'blessed' (*beatus*). B. is generally only preliminary to canonisation (q.v.).

Beating the Bounds, see BOUNDS.

Beaton, or Bethune, Cardinal David (c.1494-1546), prelate, son of John B., or Bethune, of Balfour in Fife. He went to France to study civil and canon law, and in 1519 was appointed resident for Scotland at the Fr. court. In 1533 B., now prothonotary apostolic (a high office in the church), was sent as an ambas. to France to treat for a league with the Fr. king and a marriage between James V and the Fr. princess. In 1537 he procured the papal bull for the erection of St Mary's College at St Andrews; in 1538 became a cardinal, and 1539 primate of St Andrews. Even after the death of James V, 1542, B. still had great influence, and with the help of the nobles forced the regent to abjure the doctrine of the Reformation. B.'s main interests were political: he worked for a Franco-Scottish alliance, which involved him in enmity with the pro-Eng. Protestants. The following year Mary Queen of Scots was crowned, and B. became chancellor. In 1546 he tried and condemned George Wishart to be burnt, and shortly afterwards a group of Wishart's friends murdered him at St Andrews in revenge.

Beaton, or Bethune, James (d. 1539), Scottish prelate, uncle of Cardinal David B., was lord treasurer of Scotland, 1505; Archbishop of Glasgow, 1509; chancellor, 1513; and Archbishop of St Andrews and primate, 1522. As one of the regents during James V's minority, he was a chief mover in the Fr. alliance. Patrick Hamilton and other reformers were burned during his primacy. Another James B. (1517-1603) was a nephew of the cardinal. He was in the confidence of Mary of Guise when regent, and was the last pre-Reformation Rom. Catholic Archbishop of Glasgow, 1552 to 1560, when he fled to France.

Beatrice, see DANTE ALIGHIERI.

Beatrice, Princess (1857-1944), youngest daughter of Queen Victoria. In 1885 she married Henry Maurice, Prince of Battenberg (see BATTENBERG). She had 3 sons, the eldest of whom was made Marquess of Carlsbrooke, and her daughter, Victoria Eugénie, married King Alfonso XIII of Spain in 1906. Her sons, in 1917, took the name of Mountbatten. On her husband's death, in 1896, she succeeded him as Governor of the Isle of Wight.

Beattie, James (1735-1803), poet and philosopher, b. Laurencekirk, Kincardine. He was educ. at Marischal College, Aberdeen, where in 1760 he became prof. of moral philosophy and logic. In 1770 he won temporary fame with his *Essay on Truth*, written to confute Hume. Johnson, always zealous for Christianity, praised it at the expense of Hume, who estimated the ephemeral effusion at its true worth, and refrained from answering it, beyond saying that he 'had not been used like a gentleman.' George III received B. with great warmth

and his fortune was made. Sir Joshua Reynolds introduced B. in a metaphorical painting as the Defender of Truth, with Hume and Gibbon skulking low with diabolical faces. In 1771-4 B. pub. *The Minstrel*, a poem for which alone he is remembered; it contains some beautiful descriptive passages. In 1773 he was awarded a pension of £200. He d. of palsy. His *London Diary* was ed. by R. S. Walker in 1946. See life by Sir Wm Forbes, 1807.

Beattock, vill. of Dumfriesshire, Scotland, 2 m. SW. of Moffat, in upper Annandale. Auchen Castle (1 m. NNW.), late 13th cent., is now an hotel.

Beatty, David, 1st Earl (1871-1936), admiral, second son of David Longfield B., of Borodale, co. Wexford; educ. at the Royal Naval Academy, Gosport, and entered the navy as a cadet in 1884. He became lieutenant, 1892, and served in Egypt and the Sudan with the naval brigade—being in the expedition to Dongola in 1896 (received D.S.O.), and being present (1897-8) at the battles of Atbara and Khartoum. Became commander, 1898. In the expedition to China in 1900, on account of the Boxer rebellion, he was wounded, and promoted captain. He was made rear-admiral by special order in council in 1910, and in 1912 became naval secretary to the First Lord of the Admiralty (Churchill). In 1913 he took command of the battle-cruiser squadron, and, when the First World War broke out, he conducted the first move at sea against Germany—the raid into Heligoland Bight, 28 Aug. 1914. On 24 Jan. 1915 at the Dogger Bank he intercepted von Hipper, coming to bombard the E. coast. The same year he was made vice-admiral. He again encountered von Hipper at the battle of Jutland, 31 May 1916, whose fleet he successfully enticed into the range of the Brit. Grand Fleet. The indecisive battle which followed led to some div. of opinion in the fleet as to the merits of Jellicoe and B., and the controversy spread to the press. Even the pub. of Sir Julian Corbett's last vol. of the *Official History of the Great War Naval Operations*, 1920, did not satisfy public opinion. In his *The Jutland Scandal* Adm. Sir Reginald Bacon (q.v.) accused B. of incompetence and inexperience. Two other books, *The Truth about Jutland* by Adm. Harper, who was entrusted with the task of producing a report on the battle, and *The Riddle of Jutland* by Adm. Harper and Langhorne Gibson, expressed the view that the conduct of the battle by Jellicoe was wise and well judged, while B. was criticised for neglecting the training of his command in gunnery and signalling, and for the rashness of his handling of it in action. Rear-Adm. W. S. Chalmers in his book *Life and Letters of David Beatty*, and many other critics, however, take the opposite view. (See also JUTLAND, BATTLE OF.) On Jellicoe becoming First Sea Lord, Dec. 1916, B. was made Commander-in-Chief of the Grand Fleet, a position he held till the end of the war. On board his flagship, the *Queen Elizabeth*,

at Scapa Flow in the Orkneys, 16 Nov. 1918, he received from Rear-Adm. Hugo von Meurer the surrender of the Ger. Grand Fleet, which von Reuter soon afterwards sank. In 1919 he was made admiral and admiral of the fleet; he also became First Sea Lord of the Admiralty. Between then and 1927 he conducted the reduction of the navy to a peace footing; and he was Brit. delegate to the Washington Conference on the Limitation of Armaments, 1921. He was awarded the G.C.B. and O.M., and held many foreign decorations. His peerage was conferred on 27 Sept. 1919, when he took the title of Earl Beatty, Viscount Borodale, and Baron Beatty of the North Sea and of Brooksbury.

Beau Nash, see NASH, RICHARD.

Beau Séant, or **Baucant**, banner belonging to the knights templars in the 13th cent. It was an oblong flag party argent and sable.

Beaucaire, Fr. tn in the dept of Gard, on the Rhône, at the head of the Rhône-Sète canal. There are Rom. remains, and a ruined 13th-cent. château. B. was once famous for its fair, and has cloth and leather manufs., and stone quarries. Pop. 9300.

Beauce, La, dist. of central France, the prin. tn of which is Chartres. It includes parts of the depts of Eure-et-Loir, Loir-et-Cher, and Loire (qq.v.), and is very fertile. It is called 'the granary of Paris' from the amount of wheat produced. Area c. 2800 sq. m.

Beauchamp, name of an anct and noble family of England. The founder, Walter de B., obtained large estates in Wores by his marriage with the daughter of one of the Conqueror's barons; from him descended Wm of Elmley, whose marriage with the heiress to the earldom of Warwick in 1268 brought Warwick Castle and the earldom to his son. Of the B. earls of Warwick commemorated in the famous B. Chapel in St Mary's Church, Warwick, the prin. was Guy, the 'black cur of Arden,' the enemy and executor of Piers Gaveston, and one of the lords ordainers in the opposition to Edward II. The last B. earl of Warwick d. in 1445, and his sister Anne brought the earldom to the Nevilles on her marriage with Richard, the king-maker. The present earls B. are descended from Wm Lygon, who claimed descent through the female line from a cadet branch of the anct family, the B.s of Powycke, and who was created Baron B. in 1806 and Earl B. in 1815. The viscounty of B. of Hache, granted to Edward Seymour, Lord Protector Somerset, belonged to a distinguished family in Somerset. The title remains with the Marquess of Hertford, and the name in the family of the B. Seymours.

Beauchamp, Alphonse de (1767-1832), Fr. historian, b. Monaco; joined the Sardinian army, and was imprisoned for refusing to serve against the Fr. Rep. He came to Paris and obtained a gov. post at the ministry of police at the head of the press bureau. In 1806 he pub. his best-known historical work, *Histoire*

de la Vendée et des Chouans, which led to his retirement to Rheims. He returned to his post in 1811, but resigned at the Restoration.

Beauchamp, Kathleen Mansfield, see MANSFIELD, KATHERINE.

Beauchief, dist. of the city of Sheffield (q.v.), Yorks, but still independent of eccles. jurisdiction. It was once an extraparochial liberty, as the estate of B. Abbey (founded 1175, dissolved 1536). The tower of the abbey remains as part of the church of St Thomas a Becket, built in the 17th cent. of stones from the rest of the abbey.

Beauclerk, Topham (1739-80), bibliophile, grandson of the 1st Duke of St Albans. He amassed a library of 30,000 vols., but is chiefly remembered as the friend of Dr Johnson, and a member of the famous Club. His wit, personal charm, taste in literature, and knowledge as a man of the world endeared him to Johnson, and he figures largely in Boswell's pages. See also J. Forster, *Life and Adventures of Oliver Goldsmith*, 1843.

Beaufort, name of a noble Eng. family, members of which were earls and dukes of Somerset and earls and marquesses of Dorset; also the title of a dukedom, borne by members of the family of Somerset, descended from the B.s. The name of B. was borne by the children of John of Gaunt by Catherine Swynford, who were legitimated after their parents' marriage in 1396. Of these, John (d. 1410), Earl of Somerset and Marquess of Dorset, was a supporter of Richard II against the lords appellant; Thomas (d. 1427), Duke of Exeter, was one of Henry V's generals; Henry (d. 1447) was Bishop of Winchester and cardinal (see BEAUFORT, HENRY). Margaret was daughter of John, 3rd Earl of Somerset (1403-44) (see BEAUFORT, MARGARET). Three successive B.s, earls and dukes of Somerset, were killed or beheaded during the Wars of the Roses, supporting the house of Lancaster. Charles, the illegitimate son of one of these—Henry, 3rd Duke of Somerset, beheaded after Hexham, 1464—was a favourite of Henry VII and Henry VIII, and made Earl of Worcester; his descendant, Henry, 5th earl, was a loyal supporter of Charles I, and was made a marquess in 1642; in 1682 the 3rd marquess was made Duke of B., the title now held by the 10th duke.

Beaufort, Henry (c. 1377-1447), Eng. cardinal and bishop, was the son of John of Gaunt and Catherine Swynford (see BEAUFORT, family). He entered the Church and was made Bishop of Lincoln in 1398, and on his half-brother Henry IV attaining the throne he became chancellor, 1403, and Bishop of Winchester, 1404. He was also chancellor in 1413, and in 1424. During the reign of Henry V and the minority of Henry VI he was the leader of the party opposed to Humphrey, Duke of Gloucester, especially in the matter of making peace with France. In 1426 he was made a cardinal by Martin V, for whom he had voted in 1417 at the Council of Constance, and was sent as papal legate to conduct a crusade against

the Hussites in Hungary and Bohemia. He crowned Henry VI as King of France in 1431. Charges were made against him by Gloucester, and attempts to deprive him of his see failed. He refounded and endowed the hospital of St Cross near Winchester, which still exists, and on several occasions advanced large sums of money to the crown. See L. B. Radford, *Henry Beaufort*, 1908.

Beaufort, Louis de (d. 1795), Fr. historian. Little is known of his life. He was one of the first writers who questioned the trustworthiness of the classical historians in the early hist. of Rome. His works include *Dissertation sur l'incertitude des cinq premiers siècles de l'histoire romaine*, 1738 (second ed., 1750), *Histoire de César Germanicus*, 1761, and *La République romaine*, 1766.

Beaufort, Margaret, Countess of Richmond and Derby (1443-1509), daughter of John, Duke of Somerset (see BEAUFORT, family). She married, 1455, Edmund Tudor, Earl of Richmond, by whom she was mother of Henry, Earl of Richmond, afterwards Henry VII. After her first husband's death she married Henry, son of the Duke of Buckingham, and thirdly, Thomas Stanley, Earl of Derby. During the Wars of the Roses she lived at Pembroke Castle; later she took part in arranging the marriage of her son and Elizabeth of York. She founded the Lady Margaret professorships of divinity at Oxford and Cambridge, and founded by will St John's and Christ's Colleges, Cambridge. See life by E. M. Routh, 1921.

Beaufort, cap. tn of Beaufort co., S. Carolina, U.S.A., situated on Port Royal Is., on the Beaufort R., 16 m. from the sea. It has a harbour. Its climate has made it a popular winter resort. It is a canning, processing, and shipping point for a truck and sea-food area. The tn was first permanently settled in 1716, and was named in honour of Henry Somerset, Duke of Beaufort. Pop. 5086.

Beaufort-en-Vallée, tn in the dept of Maine-et-Loire, France, with a trade in corn, fruit, and linen. Pop. 3300.

Beaufort Scale, scale of numbers for recording wind velocity at sea, invented in 1805 by Adm. Sir Francis Beaufort. See WIND.

Beaufort Testimonial, result of a subscription raised in 1860 to commemorate the services of Sir Francis Beaufort (1774-1857), rear-admiral, to the Brit. Navy. It took the form of an ann. prize awarded to the cadet of the Royal Naval College who, as a candidate for the rank of lieutenant, passed most successfully his examination in navigation and kindred subjects.

Beaufort West, tn, cap. of B. W. div., Cape prov., S. Africa, 339 m. N.E. of Cape Town on the line to Kimberley. It lies 2792 ft high, on the S. slopes of the Nieuwveld Mts, and is the largest tn in this part of the Great Karroo. The dist. is excellent for sheep farming, and there is a rapidly growing karkul industry. Pop.: Whites, 6556; Coloureds, 5174; Bantu, 2188.

Beaugency, Fr. tn in the dept of Loiret, on the Loire, which is spanned by a bridge of 26 arches. It has many anc. buildings, including 'Caesar's Tower,' an 11th-cent. dungeon. Joan of Arc defeated the English here in 1429. Wines, woollens, and leather goods are manuf. Pop. 3600.

Beauharnais, Alexandre, Viscomte de (1760-94), Fr. general, b. Martinique, was descended from an anc. noble family in Orléannois. In 1779 he married Joséphine Tascher de la Pagerie, afterwards the first wife of Napoleon, by whom he had Eugène de B. (q.v.), and Hortense, wife of Louis Bonaparte, King of Holland, and mother of Napoleon III. B. served in the Amer. War of Independence, came to France and joined the revolutionary party. He was secretary to the assembly, and commanded the army of the Rhine, 1793; his failure to relieve the siege of Mainz, and the suspicion attached to his noble birth, brought on him the enmity of the Committee of Public Safety, and he was tried and guillotined.

Beauharnais, Eugène de (1781-1824), Fr. soldier, son of Viscount Alexandre B., b. Paris; after his father's death his mother, Joséphine, married Napoleon Bonaparte. Eugène accompanied Bonaparte to Italy and Egypt, was made a prince of the empire, and appointed viceroy of the (so-called) kingdom of Italy; he married, in 1806, the daughter of the King of Bavaria. He fought with distinction against the Austrians and the Russians. After Napoleon's final defeat, B. was compensated for the loss of his lt. lands, and bought the duchy of Leuchtenberg, in Bavaria, where he lived until his death.

Beauharnois, Charles, Marquis de (d. 1749), Fr. Governor-General of Canada (1726-47). His task was to maintain the then Fr. colony of New France, as it was called, against Eng. designs, and to do all in his power to encourage Fr. immigration. Fr. tradition, however, seemed to look upon New France mainly from the strategic standpoint, and but little attention was paid to its political or social development. B. tried to promote the movement of Canadian expansion towards the W. of the country, and to that end he commissioned the valiant Pierre de la Vérendrye, an explorer and native of Three Rivers, then commanding officer at Lake Nipigon, to organise an expedition, in 1731. The result of this expedition was the estab. of a number of trading posts between Lake Superior and the Saskatchewan R. The rivalry between the Fr. and Brit. colonists in commerce, however, led to a renewal of war, and B. set to work to strengthen the Fr. position by building new forts, among which was Fort Ticonderoga on Lake Champlain. He returned to France in 1746. His name has been given to a large hydro-electric station on the St Lawrence, above Montreal.

Beaujeu, Fr. tn in the dept of Rhône, 27 m. from Lyon. It has a wine industry. Pop. 2000.

Beaujolois, anc. dist. of France, formerly part of the prov. of Lyonnais (q.v.),

now forming parts of the depts of Rhône and Loire. It is famous for its wine, the centre of the trade being Villefranche (q.v.). It produces from the *gamay* grape beverage wines secondary to those of the Côte d'Or. Moulin-a-Vent is its best-known red wine and Pouilly-Fuissé its best-known white wine.

Beaujoyeux, Balhasar de, see BAL-TAZARINI.

Beaulieu, Walter Edward Douglas Scott Montagu, Baron Montagu of (1866-1929), motoring pioneer, son of Lord Henry Scott Montagu and grandson of the 5th Duke of Buccleuch. Educ. at Eton and Oxford, and trained in engineering in railway workshops. In 1916 was adviser on mechanical transport to the Indian gov. Later took up aviation.

Beaulieu, par. of Hants, England, on the estuary of the B. riv., about 5 m. from Southampton. The ruined Cistercian abbey was founded (1204) by King John and sheltered Margaret of Anjou after the battle of Barnet (1471). The Early Eng. refectory is now the par. church; the former gatehouse is a private residence. Pop. 1000.

Beaulieu (pronounced Bewley), tn, Inverness-shire, Scotland, 10 m. W. of Inverness. Here are the remains of the Cistercian monastery of St John, 1230, and the site of Lovat Castle. Pop. 800.

Beaumarchais, Pierre Augustin Caron de (1732-99), Fr. dramatist, b. Paris, son of a watchmaker. He was brought up as a watchmaker, and also showed great skill in music, playing the harp and guitar. He led an adventurous and sometimes unscrupulous life, now as a business man, now as a political agent in England, Germany, and Austria. He had numerous lawsuits, and was imprisoned more than once. Most of his attempts at drama were unsuccessful, as also his opera *Tarare*, 1787. His fame rests on his two plays *Le Barbier de Séville*, 1775; and *Le Mariage de Figaro*, 1784. Both comedies of intrigue, they are traditional in theme, but at the same time sparkling with wit, gaiety, and movement. An additional interest in his own day were the thrusts at the aristocracy, especially in the *Mariage de Figaro*. The characters are drawn with great artistry, and many of them have become immortal. The plays have been made into operas by Paisiello, Rossini, and Mozart. B. holds a high place as a satirist, and is undoubtedly the best of the Fr. dramatists of the 18th cent. See L. Latzarus, *Beaumarchais*, 1930; P. Frischauer, *Beaumarchais*, 1935; G. Giffie, *Le Mariage de Figaro*, 1938.

Beaumaris, port and mkt tn, also the cap. of Anglesey, Wales. It is situated on Beaumaris Bay, to the N. of Menai Strait. The harbour is safe and roomy. The tn is frequented by summer visitors, who are attracted by the golf-links and the sea bathing. There are slate quarries in the neighbourhood. The castle was founded by Edward I in 1295. Pop. 1700.

Beaumes, Fr. vil. in the dept of Vaucluse, with a trade in wine. Pop. 1300.

Beaumont, Eon de, see EON DE BEAUMONT.

Beaumont, Francis (1584-1616), poet and dramatist, b. Grace-Dieu, Leice, son of a judge of the Court of Common Pleas. He matriculated at Broadgates Hall (now Pembroke College), Oxford, in 1597, and in 1600 was entered at the Inner Temple, for which he wrote a masque in 1613. In 1602 he pub. *Salmacis* and *Hermaphroditus*, a poem based on a tale of Ovid's. He became a close friend of Drayton and Ben Jonson, for some of whose plays he wrote commendatory verses, and from an early period was closely associated with John Fletcher (q.v.). They shared lodgings and servant, and collaborated in writing plays from 1606 onwards, B. excelling in



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plot-construction and sense of theatre. The partnership came to an end not long after B.'s marriage in 1613 to Ursula Isley, an heiress. He d. soon after and was buried in Westminster Abbey. Some 50 plays were attributed to the 2 playwrights in a collected ed. pub. after their deaths, but this is obviously far too many for their period of collaboration, and was presumably a publicity device of the publishers. Much time has been spent in unravelling the puzzle of the joint authorship; it is maintained by recent authorities that B. was solely responsible for two plays: *The Woman Hater*, 1607, and *The Knight of the Burning Pestle*, 1609; and that he and Fletcher together wrote some dozen plays, including *Four Plays in One*, 1608, *Philaster*, *The Maid's Tragedy*, *A King and No King*, *Cupid's Revenge*, and *The Coxcomb*, dated about 1611 or 1612; and *The Scornful Lady*, and *Thierry and Theodoret*, pub. 1616. A further vol. of B.'s *Poems* appeared in 1640. The standard ed. of B. and Fletcher is that of A. Glover and A. R. Waller (10 vols.), 1905-12; variorum ed. by A. H. Bullen, unfinished, 1904-12. See also G. C. Macaulay, *Francis Beaumont, a Critical Study*, 1883; C. M.

Gayley, *Francis Beaumont, Dramatist*, 1914; U. M. Ellis-Fermor, *The Jacobean Drama*, 1936; L. B. Wallis, *Fletcher, Beaumont and Co.*, 1947.

Beaumont, Sir George Howland (1753-1827), baronet, seventh of the arot family of the B.s of Stoughton Grange, Leics, educ. at Eton. He was a distinguished amateur of the arts and friend of artists, Constable among them. He had some skill as a landscape painter, and gave a number of pictures to the National Gallery (q.v.) at its foundation.

Beaumont, Jean Baptiste Elie de (1798-1874), Fr. geologist, b. Canon. He went to England with a view to preparing a geological map of France after the pub. of Greenough's map, 1820. The result was later seen in the map pub. by him and Dufrenoy, 1840, his greatest service to geology. He was engineer in chief, 1833, and inspector-general of mines, 1847. He was perpetual secretary of the Academy of Sciences, 1853, in succession to Arago. His theory of the origin of mountains, *Notice sur le système des montagnes*, 1853, is not now accepted, but it was of great value from the detailed researches he made in its preparation.

Beaumont, Sir John (1582-1627), poet, b. Leics, an elder brother of Francis B., and educ. at Oxford, which he entered in 1597. He was knighted in 1603, and made a baronet in 1626. In religion he was a Puritan. His best-known poem is *Bosworth Field*, first pub. by his son, 1629. Among his friends, not the least intimate was Michael Drayton. He was buried in Westminster Abbey. His works were ed. by A. B. Grosart, 1869.

Beaumont, Joseph (1616-99), poet, b. Hadleigh, Suffolk. He was educ. at Peterhouse, Cambridge, of which he was Master from 1663. In 1674 he was appointed Prof. of Divinity. He wrote *Psyche, or Love's Mystérie*, 1648, an allegory of the progress of the soul. His works were ed. by A. B. Grosart, 1877-80, and his minor poems by E. Robinson, 1914.

Beaumont, William (1785-1853), Amer. physician, b. Lohanon, Connecticut. After an elementary educ. B. worked on the land and then became a schoolmaster. Wishing to study medicine, he became apprenticed to Dr Benjamin Chandler at St Albans, Vermont, and received his licence to practise in 1812. In the same year he joined the Amer. army and served as a surgeon's mate during the war with England. In 1815 he left the army and entered into partnership at Plattsburgh, New York. In 1822 he was called to attend a patient, Alexis St Martin, a young French-Canadian, who had received a gunshot wound in the upper abdomen. B. found a large opening into the stomach which persisted after St Martin had recovered. By suspending articles of food into the stomach and by other means B. was able to study human digestion and stomach movements for the first time in a living person. He took St Martin into his own home and made observations on him over a period of 8

years and although his subject absconded he followed him to various parts of the country. His classical experiments are described in his *Experiments and Observations on the Gastric Juice*, 1833 (facsimile reprint, 1939). See *Life and Letters*, by J. S. Myer, 1912.

Beaumont: 1. Co. seat of Jefferson co., Texas, U.S.A. Incorporated in 1881, it has a pop. of 94,000. Chief industries are oil, steel, lumber, shipping, and agriculture.

2. Small tn in the prov. of Hainaut, Belgium, 15 m. SW. of Charleroi. There are marble quarries and iron works in the dist. Pop. 1700.

Beaumont College, public school for boys, situated in Old Windsor, Berks, England, founded in 1861 by the Society of Jesus, and run by members of the society. Warren Hastings once owned the property.

Beaumont-Hamel, vil. of France in the dept of the Somme. The vil. and its immediate neighbourhood were the scene of heavy fighting in the battles of the Somme and Ancre in 1916. The position was a difficult one to attack. In the Somme battle, on 1 July the 8th Army Corps, under Gen. Sir Hunter Weston, was detailed to make the assault on this part of the line, but the attack failed, with severe losses all round, and the assault had to be abandoned. At the battle of the Ancre in the following Nov., however, the Brit. forces gained a considerable victory by capturing the vil. (see ANCRE, BATTLE OF THE).

Beaumont-sur-Oise, Fr. tn in the dept of Seine-et-Oise. Cement and lace are manuf., and there is agric. trade. Pop. 5400.

Beaumont-sur-Sarthe, tn in the dept of Sarthe, France, on the riv. of the same name, and about 15 m. S. of Alençon. Pop. 1800.

Beaune, Florimond de (1601-52), Fr. geometer and friend of Descartes (q.v.), b. at Blois. He commented on Descartes's geometry, is noted for his problem on curves, and invented sev. astronomical instruments. His discussion on the superior and inferior limits to the roots of an equation was not pub. till 1659.

Beaune, tn in the dept Côte-d'Or, France. It is the centre of the burgundy wine trade (q.v.) and it manufs. casks, oil, mustard, white metal. It has two 12th-cent. churches, and a hospital founded in 1443. In the 18th cent. there were nine religious houses in the tn. B. appears as a fortified place as early as the 17th cent., and for some time was the cap. of a separate duchy. United to Burgundy in 1227 it became the first seat of the Burgundian Parliament. Pop. 11,000.

Beaune-la-Rolande, Fr. tn in the dept of Loiret. It is of great antiquity, was devastated by the English in the Middle Ages, and its church was rebuilt by Charles VII. The French were defeated here by the Germans in 1870 (see FRANCO-GER. WAR). Pop. 1800.

Beaupréau, tn in the dept Maine-et-Loire, France, situated on the Evre, about 28 m. from Nantes. It has a

market for live-stock and a trade in cloth. Pop. 4200.

Beauregard, Pierre Gustave Toutant (1818-93), Amer. general, b. New Orleans. Appointed general, Aug. 1861, he commanded the Confederate Army at Shiloh, 1862, after A. S. Johnston's death in the battle and withdrew to Corinth, which position he defended against Halleck for a month. From Sept. 1862 till May 1864 he defended Charleston, and then defeated Butler at Drury's Bluff. He surrendered with J. E. Johnston after the campaign against Sherman in 1865. See A. Roman, *Military Operations of General Beauregard*, 1883, and T. H. Williams, *P. G. T. Beauregard; Napoleon in Gray*, 1955.

Beaurepaire, Fr. vil. in the dept of Isère, 18 m. SE. of Vienne (q.v.). Pop. 2700.

Beausobre, Isaac (1659-1738). Fr. Protestant, studied at Saumur. After the revocation of the Edict of Nantes he fled to Holland and Germany. He was a favourite with Frederick William I and lived at Berlin 46 years. He wrote critical and historical work on the N.T.

Beausset, Le, Fr. vil. in the dept of Var, with a trade in oil and wine. Pop. 1900.

Beauty, that quality in visible objects in consequence of which their colours and forms are agreeable to the human mind. Though at first applied to objects perceptible by the sight, an easy transition extended the meaning of the word to include the other senses. By a further extension, beautiful has become merely a term of praise synonymous with admirable, e.g. beautiful language. See AESTHETICS.

Beauvais (anc. Bellovacum or Caesaro-magus), Fr. tn, cap. of the dept of Oise, at the confluence of the Thérain and the Avon. In 1472 occurred the famous siege when Jeanne Hachette (q.v.) defended the tn against Charles the Bold, an event commemorated ann. by a procession in which the women precede the men. B. is the seat of a bishop. The magnificent cathedral, begun in 1227 and never finished, contains the highest of Gothic arches; it was damaged in the Second World War. The earlier cathedral, dating back to 997, called the Bassed'œuvre, still exists. In Oct. 1930 the Brit. airship *R 101* (see AIRSHIP) came down in flames at B. Villiers de l'Isle-Adam was a native of the tn. Carpets, woollens, and brushes are manuf. The Gobelin tapestry (q.v.) factory was destroyed in the Second World War. Pop. 23,200.

Beauvoisais, or **Beauvaisis**, dist. of France, formerly comprised in the gov. of Picardy, then of the Île-de-France; now part of the arron. of Beauvais in the dept of Oise.

Beaux-Arts Institute of Design, Amer. school of the arts situated in New York, and modelled after the analogous society in Paris. It was founded in 1916 by the Society of Beaux-Arts Architects to teach the fine arts, at the lowest practicable cost, with the aim of carrying the student

beyond the academic stage to that of practical application; and, further, to bring about co-operation among the different art schools of the U.S.A.

Beaver, Sir Philip (1766-1813), naval captain. At the age of 11 he accompanied Capt. Joshua Rowley in the *Monarch*. He joined a scheme of colonisation in Bulama Is., near Sierra Leone, but the venture proved disastrous.

Beaver (*Castor*), name applied to a genus of rodents of the family Castoridae. There are only 2 species, *C. fiber* and *C. canadensis*: the former is a native of Europe, and the latter of N. America. They are related to squirrels and prairie dogs, and are noted for their intelligence,



their skill in building houses and dams, their glossy fur, and glands which secrete castoreum, used in medicine. In length they are about 1 to 2 ft, while the broad, flat tail is about another foot long; their feet are webbed. Their food consists of the bark of trees and occasionally they eat fruit. They live in large communities in burrows or lodges near the banks of a stream, for in habit they are aquatic. To obtain wood, both for building and for food, they gnaw round the bases of trees until they fall, when they float them down stream to their houses. When the wood near home is exhausted they construct canals and dams so that they may bring into their power the wood beyond their reach at the time, and in this way whole tracts of land are deprived of timber and covered with water. The European B.s construct dams only in certain parts of its range, particularly in Russia and Scandinavia, but *C. canadensis* by its construction does much damage. Their houses, or lodges, are built on the banks of streams or on small is., and are made of twigs, moss, and grass plastered together with mud, and the entrance passage is often protected by piles of sticks. The B. is hunted on account of its fur, the fatty castoreum, and its flesh

—especially that of the tail—and is in danger of total extermination. See E. R. Warren, *The Beaver*, with full bibliography (London and Baltimore), 1927.

Beaver Falls, tn, Beaver co., Pennsylvania, U.S.A.; it lies 28 m. NW. of Pittsburgh on a plateau above the Beaver R. It has a large manuf. of iron and steel goods of all descriptions; also chinaware, cork products, paint, lumber, bricks, textiles. Other products are bituminous coal and clay, and agriculture is practised. The Presbyterian Geneva College is now at Colloge Hill close by. Pop. 17,335.

Beaver Rat, name given in Australia to the native water-rat of the genus *Hydromys*, family Muridae, and order Rodentia. These small mammals are related to voles, hamsters, and lemmings. Also a name given to the coypu (q.v.).

Beaver-tree, sweet bay, or swamp laurel, the *Magnolia virginiana*, growing in swampy ground from Massachusetts to Florida. It has evergreen leaves and round fragrant white flowers.

Beaverbrook, William Maxwell Aitken, 1st Baron, of Beaverbrook, New Brunswick, Canada, and of Cherkley, Surrey (1879-), politician and newspaper proprietor, b. Maple, Ontario, son of the Rev. Wm Aitken, minister of Newcastle, New Brunswick. W. M. Aitken went into business at Halifax, Nova Scotia. In 1907 he became a stockbroker in Montreal, where in 1910 he began what ended in the amalgamation of all the Canadian cement-mills—making a fortune on the deal. Then he came to England, and as Conservative parl. candidate won Ashton-under-Lyme, 1910. He became private secretary to Bonar Law (q.v.) and was knighted in 1911. Early in the First World War Aitken was at the front, in the capacity of the Canadian Gov.'s 'eye-witness'; he was made a baronet and a peer in 1917 after Lloyd George had become premier. He was chancellor of the Duchy of Lancaster and minister of information, 1918-19. Afterwards he turned his attention to the management of newspapers. Having already a considerable share in the London *Daily Express*, he now took sole charge of it; he then estab. the *Sunday Express*, and bought the *Evening Standard* from the Hulton group. On the defeat of the Conservative party at the polls, May 1929, he launched his 'Empire Free Trade' policy. During the Second World War he was appointed minister for aircraft production in the Churchill gov. in May 1940. He at once put in hand a programme for a greatly increased output of essential types of machine, particularly Spitfires, Hurricanes, and Whitley bombers. In Aug. 1940 he was made a member of the War Cabinet; minister of state, 1941; minister of supply, 1941-2; and lord privy seal, 1943-5; he was made honorary chancellor of the univ. of New Brunswick, 1947. Pubs.: *Canada in Flanders* (2 vols.), 1916-17; *Success*, 1921; *Politicians and the Press*, 1925; *Politicians and the War* (2 vols.), 1928-1932; *The Resources of the British Empire*, 1934; *Don't Trust to Luck*, 1954; *Three*

Keys to Success, 1955; *Men and Power*, 1956. See lives by F. A. Mackenzie, 1931; Edgar Middleton, 1935; W. J. Brittain, 1941; Tom Driberg, 1956.

Bebel, Ferdinand August (1840-1913), Ger. Socialist and leader of the Social-Democratic party, b. at Cologne. He worked as a turner at Leipzig, joined the Working Men's Association, 1863, and became a Socialist, 1865. In 1867 he was elected to the N. Ger. Reichstag and to the united Ger. Reichstag in 1871, of which he remained a member until his death. He opposed the war of 1870, and in 1871, as the only Socialist member, the annexation of Alsace. In 1872 he was imprisoned for high treason. With Liebknecht he organised the Social-Democratic party and joined the staff of *Vorwärts*, 1890. His oratorical powers gave him a commanding position in his party, which survived the attacks of the more violent 'young' Socialists on one hand and the 'Revisionists' on the other. He became leader of the parl. Socialists and was a confirmed adherent to Marxian principles. His pubs. include an autobiography, *Aus meinem Leben*, 1910-14.

Bebington, municipal bor. of Cheshire, England, on the Mersey estuary immediately S. of Birkenhead. B. is residential and industrial, and includes Bromborough, Eastham, a model vill., and the soap and detergent works of Port Sunlight (q.v.). Pop. 47,742.

Bec, Abbey of, Benedictine abbey, near Bernay, Normandy. It was founded by Herlwin or Herlewin in 1034. Under Lanfranc as prior and Anselm, prior and abbot, it became the centre of learning in Europe. The old abbey buildings are now in ruins, but there is a Benedictine community of B.

Beccafumi, Domenico (1486-1551), It. painter, b. Siena, son of a peasant, Giacomo di Pace, who was employed on the estate of Domenico's subsequent patron, Lorenzo Beccafumi. Domenico was at one time known as Il Mecherino, from the name of an artist with whom he worked; but, later, he was known by the name of his patron. He painted in distemper and in oil; better in the former style, and his small figures are superior to his larger ones. He is remembered chiefly for the work he did for the famous marble pavement of the Duomo of Siena. His best works are in Siena.

Beccaria, Cesare Bonesana, Marquis of (1735-93), It. writer on moral and political philosophy, b. Milan and educ. at Parma. He wrote primarily on economic matters, but his best-known work is *Concerning Crimes and Punishments*, a legal work considerably in advance of his time. In 1768 the Austrian gov. founded a chair of political philosophy for him at Milan. See CAPITAL PUNISHMENT.

Beccaria, Giovanni Battista (1716-81), It. physicist, b. Mondovì; studied theology at Rome, and was prof. of natural philosophy at Palermo. In 1748 the King of Sardinia appointed him to the chair of natural philosophy at Turin. He pub. various works on electricity; elected a fellow of the Royal Society,

London, 1755, and contributed a number of papers to the *Philosophical Transactions*, the prin. one of which was *Dell' Eletticismo Naturale ed Artificiale*, 1753, English trans. 1776.

Beccles, municipal bor. and mkt tn of Suffolk, England, on the R. Waveney, 6 m. W. of Bungay, in the area of the Norfolk broads, and a favoured holiday yachting resort. An ann. regatta is held in Aug. Printing is the main industry, and there are also ironworks, flour mills, and maltings. Pop. 6900.

Bečej (Bece), tn in Serbia, Yugoslavia, on the Marshal Tito canal. It has mineral springs, and is a commercial and agric. centre. Pop. 23,400.

Bee-ŋn, Fr. name for various warblers of the family Turdidae. It includes such thin-billed birds as the stone-chat and hedge-sparrow.

Beche, Sir Henry Thomas de la (1796-1853), geologist, b. London. He carried out a geological survey of SW. England which he induced the gov. to support, and thus started the first Geological Survey in the world (1832). He directed Geological Survey from its official foundation in 1835 to his death, and was largely instrumental in founding the Museum of Practical Geology and the Royal School of Mines. A pioneer in applied science. Knighted, 1848. President, Geological Society, 1847-9.

Bêche de Mer, often known by the Malay name *trepang*, or as sea-slug or sea-cucumber, species of holothurian echinoderms, about 5-12 in. long, with either smooth or warty skins. They are found chiefly off the coasts of the E. Archipelago and New Guinea and Queensland. First boiled and then dried in the sun and smoked, they are used in gelatinous soups in Chinese cookery, and are considered a great delicacy.

Becher, Johann Joachim (1635-82), Ger. chemist and physician, b. Spire. became prof. of medicine at Mainz; his *Physica Subterranea*, 1669, contains his experiments on various substances; Stahl's *Doctrine of Phlogiston* is indebted to him (ed. 1703). He d. in London.

Bechstein, Karl (1826-1900). Ger. pianoforte-maker, b. Gotha. He was the founder of the Berlin firm which still bears his name, and whose instruments are famous for depth of tone.

Bechuanaland, Brit. protectorate in Africa, occupying part of the central plateau of S. Africa, bounded by the Orange R. on the S., the Zambesi R. and Rhodesia on the N., the Transvaal on the E., and SW. Africa on the W. Politically it is divided into Brit. B., incorporated, 1895, with Cape Colony, area 51,424 sq. m., pop. over 90,000, of which about 20 per cent are white; and the B. Protectorate, area estimated at 275,000 sq. m., pop. (census 1951) 294,883, of which 2325 are white. The pop. of Ngamiland (1936 census) is 42,000. The protectorate is governed as a Brit. crown colony by the high commissioner represented by a resident commissioner responsible to the Commonwealth Relations Office. The chief European

centres in the protectorate are Lobatsi, Gaberones, Francistown, and Serowe.

Mafeking, in Brit. B., is the H.Q. of the protectorate administration. Until 1915 the excess of expenditure over revenue, derived principally from a hut-tax of £1 per annum, was covered by an imperial grant, but from that year revenue has exceeded expenditure (up to 1944). In 1899 the boundaries of 4 native reserves were estab.; the Bamangwato (102,000), the chief Khama's people, occupying the main portion of the NE. of the protectorate, chief in Serowe, removed from Palapye, 1903; the Bangwaketsi (24,000); the Batawana (42,000); and the Bakgatla (14,000). In 1909 the Bamaletse Reserve (6000) was also fixed. A portion of Matabeleland, the Tati concession, is attached to the protectorate. In 1922 part of SW. Africa, Caprivi-ziptel, was also incorporated, but was transferred back to SW. Africa in 1929. The W. portion of the protectorate is occupied principally by the Kalahari Desert, where big game abounds; the E. is veld, affording pasture for cattle, the chief wealth of the native peoples. The country is more pastoral than agric., crops depending entirely on the rainfall. Kaffir corn, mealies (the chief native food crop), beans, melons, and pumpkins are sown, and, ordinarily, suffice for the people's needs. The winter climate (May to Aug.) is good except in the marshy dists. round Lake Ngami in the Okavango basin, N.W., and in the Makarikari salt marshes, N.E.; the rainfall ranges from 10 in. W. to 26 in. E.; the soil is fertile but needs irrigation.

Minerals. Gold and silver are found in the Tati concession, where there is mining on a small scale. Gold and silver to the total value of £15,474 were mined in 1951.

Trade. Imports: blankets, ploughs, ironware, and groceries. Exports: cattle, hides, skins, dairy produce, and wood. Rhodesia is the best customer for sheep and goats from B. and the Union for pigs. Cattle number over 900,000 head, mostly owned by natives. European settlers trade in dairy produce.

Education. There exist at present 9 European, 5 coloured, and 144 native schools. The cost of education in 1953 was, European, £22,703, African, £77,118, Coloureds, £1,037. Under the director of education the schools are controlled, in most of the reserves, by school committees, on which the missionary bodies, together with Africans, are represented. The Bamangwato have for many years past entirely met the cost of the Khama Memorial School.

Development and welfare. As in other African dependencies, schemes are under way in B. for effecting improvements in agriculture, medical services, education, and communications, also for combating soil erosion, improving water supplies, irrigation dams, and tribal granaries.

Communications. The railway from Kimberley to Vryburg and Mafeking traverses the B. Protectorate en route to Rhodesia. A telegraph line from Cape Province runs from Mafeking through

Gaberones and Francistown to Bulawayo and Salisbury in Rhodesia.

History. Exploration began at the end of 18th cent.; in 1818 the London Missionary Society settled at Kuruman, Robert Moffat's H.Q. from 1821. Livingstone's systematic explorations commenced in 1841. After the Sand R. convention, 1852, the Boers began to encroach from the E. The appeals from the native chiefs, notably the Christian and enlightened Khama, during the seventies led to a temporary Brit. occupation. After the first Transvaal war, the Boers set up the reps. of Stellaland (at Vryburg)

Co. obtained the sole right, for 20 years, to prospect for precious stones, minerals, and metals throughout the Bamangwato country. In 1920 an advisory council, both native and European, was estab. for the benefit of the resident commissioner. The Gov. of the Union of S. Africa have from time to time made efforts to induce the Brit. Gov. to transfer the B. Protectorate, and also the other two high commission territories, to the Union, and indeed the S. Africa Act makes provision for the possibility of such incorporation. But hitherto the people of these territories have manifested no wish



E.N.A.

THE NATIVE HOSPITAL AT SEROWE, BECHUANALAND PROTECTORATE

and Goshen in the N., which they retained contrary to the London convention, 1884. Sir Charles Warren's expedition, 1884, finally brought B. under Brit. rule. The present administrative div. dates from 1895. In that year arrangements had been made to transfer the protectorate, with the exception of the native reserves, to the Brit. S. Africa Co., but as a result of the Jameson raid the Imperial Gov. again took over the administration. The same year portions of native ter. were made over to the Brit. S. Africa Co., Ltd. and are known as the Tuli, Gaberones, and Lobatsi farms. In 1896 the B. Railway Co. constructed the railway which connects the Union of S. Africa with Rhodesia. In 1910 the protectorate, excluding the Tati dist., was vested by Order in Council in H.M. High Commissioner for S. Africa, and in 1911 the Tati Concessions, Ltd were confirmed in their possession of the Tati dist. By an agreement concluded in 1932 with Tshekedi Khama, acting chief of the Bamangwato tribe the Brit. S. Africa

to change their political status, particularly in view of the fundamental difference between Brit. and S. African native policy. There are always approximately 10,000 Bechuanaland natives employed in the Rand mines. See G. B. Clark, *Transvaal and Bechuanaland*, 1883; J. T. Brown, *Among the Bantu Nomads*, 1926; J. Mockford, *Khama: King of the Bamangwato*, 1931; L. A. Mackenzie, *Report on the Kalahari Expedition*, 1945.

Beck, Sir Adam (1857-1925), Canadian engineer, b. Baden, Ontario, of Ger. parents. Educ. at Galt, Ontario, and then joined his father's business at London, Ontario. He was the creator of the hydro-electric system of power-supply which led to the development of Canadian secondary industries. He was a member of the Ontario Legislative Assembly and chairman of the Hydro-Electric Power Commission.

Beck, Josef (1894-1944), Polish soldier and politician, b. Warsaw. He served with Pilsudski's Polish Legion in 1914, and also in the Polish war with U.S.S.R.,

1919-20. When Pilsudski came to power in Poland, B. became foreign minister in 1932. He was instrumental in concluding a pact of non-aggression with Hitler's Third Reich on 26 Jan. 1934, but later signed a military alliance with Britain on 25 Aug. 1939. After the fall of Poland B. fled to Rumania, where he was interned until his death.

Beck, Richard (1897-), Icelandic poet and scholar, prof. of Scandinavian languages in the Univ. of N. Dakota, editor of *Icelandic Lyrics*, an anthology, 1930, and author of a *History of Icelandic Poets, 1800-1940*; prolific contributor to learned and literary periodicals in various languages.

Beck Case, legal case of mistaken identity. In April 1904 a man named Adolf Beck was identified by sev. women and an ex-policeman as a certain man named Smith, who had previously been imprisoned for fraud. He was tried and convicted of attempting to defraud these women again. While undergoing penal servitude he discovered that Smith was a Jew, and by personal marks he was at length able to prove his innocence. He was pardoned and offered a sum of money as compensation for his imprisonment. Smith was arrested, and Beck d. in poverty in 1909. This case was largely instrumental in bringing about the estab. in England of the court of criminal appeal. See *Trial of Adolf Beck*, ed. by E. H. Watson, 1924.

Becke, George Lewis (1855-1913), Australian novelist, b. Port Macquarie, New S. Wales, where his father was clerk of petty sessions. Educ. at a school in Sydney, he went to sea at an early age in vessels trading in the Pacific. He started writing in 1892, his first book, *By Reef and Palm*, 1894, a collection of short stories, being followed by *The Ebbing of the Tide*, 1896, *Wild Life in Southern Seas*, 1897, *Rodman the Boat-steerer*, 1899, *Tom Wallis*, 1900, *Helen Adair*, 1903, *Notes from my South Sea Log*, 1905, and others.

Beckenham, municipal bor. of Kent, England, 9 m. SE. of London, a residential area. At Monk's Orchard is the Bethlem hospital, opened in 1930. Pop. 75,160.

Becker, George Ferdinand (1847-1919), Amer. geologist, b. New York; graduated at Harvard and Heidelberg. U.S. geologist, 1879-92; afterwards on staff of U.S. Geological Survey. Reported on goldfields in S. Africa and Alaska, and on the geology of the Philippine Is.

Becker, Karl Ferdinand (1775-1849), Ger. physician and grammarian, b. Lieser on the Mosel, estab. a school at Offenbach, 1823; propounded the theory that logic is the basis of grammar. His prin. work, *Ausführliche deutsche Grammatik*, 1836-8.

Becker, Wilhelm Adolf (1796-1846), Ger. archaeologist, b. Dresden; studied under Beck and Hermann at Leipzig Univ., and became prof. of archaeology there in 1842. His greatest work is the *Handbuch der römischen Alterthümer*, 1843, finished (1868) by Marquardt and Mommsen; but his most popular books are the scenes of Rom. and Gk life in the form

of romances, *Gallus*, 1838 (new ed. 1880), and *Charicles*, 1840 (new ed. 1877); both have been trans. into English. He d. at Meissen.

Beckerath, Hermann von (1801-70), Prussian statesman, b. Krefeld; gained great wealth from the bank which he founded, 1838; was a member of the Frankfurt Parliament, 1848, and made finance minister.

Becket, Thomas (c. 1118-70), saint, chancellor, and Archbishop of Canterbury. He was of Norman stock, b. according to tradition, in Cheapside, where his father was a merchant. He was educ. at Merton Priory and later went to Paris to study theology. He was attached to the court of Theobald, Archbishop of Canterbury, c. 1142-53. When Henry II came to the throne the talented young archdeacon soon became his friend. In 1155 Henry, continuing his policy of gathering around him a group of able, trustworthy servants to carry out his programme of centralisation, made B. chancellor. During his period of office, it was said that B. was more regal in his manner than the king himself. But he was competent and loyal, and Henry was more than satisfied. B. led an embassy to the Fr. court, suggested a means of acquiring the Norman Vexin, and took an active part in the Toulouse campaign. In 1162 he seemed the obvious choice for Archbishop of Canterbury, though he was only, as yet, in minor orders. As chancellor-archbishop, and Henry's friend, Henry no doubt hoped that B. would continue to act as his instrument in both state and church affairs.

B. apparently accepted the archbishopric with reluctance. He was ordained priest on 2 June 1162, and consecrated the next day. Then he resigned the chancellorship. It was clear that he was not going to play the role that Henry had visualised for him. His way of life became that of an ascetic and he began at once to champion the rights of the Church against the king's alleged encroachments.

The dispute raged round the subject of benefit of clergy, and was embittered by the former friendship, and the uncompromising nature of both B. and the king. At first it seemed that B. would agree to Henry's demands; but when these were put down in writing as the Constitutions of Clarendon, he refused to sign them, declaring that they ran counter to canon law. In 1165 B. fled abroad. His property was seized and the revenues of his see impounded. Though he had received little support from his fellow-bishops in England, B. received support from the Pope. In 1170 a reconciliation took place between Henry and B., and B. returned to England and was enthusiastically received by the common people.

B. brought with him papal letters of suspension for the bishops who had taken part in his absence in the coronation of Henry's son; and proceeded to excommunicate all those in possession of his estates. Henry is said to have reacted with a burst of fury that carried with it

the implication that he wanted to be rid of B. permanently; though it is unlikely that he seriously wanted B. murdered if only because any such murder would be—and, indeed, was—politically inexpedient. But on 29 Dec. 1170, the archbishop was murdered by 4 knights in Canterbury Cathedral. He was immediately hailed as a martyr and canonised in 1173. Henry did public penance at his tomb (1174). B.'s shrine became famous throughout Christendom but was totally destroyed at the Reformation (1538). B.'s character remains something of an enigma to the historian; there is an interesting interpretation in T. S. Eliot's drama, *Murder in the Cathedral*, 1935. See also lives by W. H. Hutton, 1889, and R. Speaight, 1938.

Beckford, William (1759–1844), author, son of Wm Beckford (1709–70), lord mayor of London and supporter of Wilkes, was b. at Fonthill, Wilts. He inherited a fortune on his father's death. In 1783 he married Lady Margaret Gordon, daughter of the 4th Earl of Aboyne. After his wife's death in 1786 he went to Portugal. He was M.P. for Wells 1784–90, and subsequently for Hindon. In 1801 he sold the contents of Fonthill, and began the building of a new house at a cost of nearly £300,000. His eccentric habits of seclusion here gave rise to various stories. In 1822 he sold Fonthill to John Farquhar, who sold his collection of pictures and art treasures; 3 years later the tower (260 ft high) collapsed and destroyed part of the house. B. built another tower near Bath, where he lived till his death. The oriental romance for which he is chiefly remembered, *The History of the Caliph Uthek*, was originally written in French and, according to his own account, in a single sitting of three days and two nights, but there is reason to believe that this was a flight of fancy. A pirated Eng. trans. was pub. in 1786, and next year B. pub. the original French. His *Letters from Portugal* were pub. in 1834, and in the same year a reissue of his satirical *Biographical Memoirs of Extraordinary Painters*, originally written in 1780. His *Travel Diaries* were ed. by G. Chapman, 1928. See C. Redding's *Memoirs*, 1859; R. Garnett's ed. of *Uthek*, 1893; L. Melville, *Life and Letters*, 1910; J. W. Oliver, *The Life of William Beckford*, 1932; G. Chapin, *Beckford*, 1937.

Beckmann, Johann (1739–1811), Ger. scholar and writer, b. Hoya in Hanover, educ. Göttingen Univ. where, in 1766, he was made prof. of natural science. His prin. work was *Beiträge zur Geschichte der Erfindungen* (5 vols.), 1780–1805. He also wrote *Grundsätze der deutschen Landwirtschaft*, 1769, and *Anleitung zur Technologie*, 1777. It was B. who created the term 'Technology.'

Beckton, part of the co. bor. of E. Ham, Essex, England, near the l. b. of the Thames, 9 m. from London. There are extensive gas-works, and the N. outfall of the metropolitan drainage system crosses here to the bor. of Barking. Pop. 300.

Beckum, Ger. tn in the Land of N. Rhine-Westphalia (q.v.), 64 m. NE. of

Düsseldorf (q.v.). It is an important centre of the cement and limestone industries. Pop. 20,000.

Beckwith, John Charles (1789–1862), general and missionary, b. Nova Scotia, nephew of Gen. Sir Thomas B. (q.v.), served in the Light Div. in the Peninsular war, and lost a leg at Waterloo. In 1827 sympathy for the Waldensians in Piedmont made him a missionary. He settled at La Torre, founded 120 schools, and built a church.

Beckwith, Sir Thomas Sydney (1772–1831), Eng. soldier, son of Maj.-Gen. John B., who led a regiment of foot at Minden. He won a great reputation as a leader of light troops, and was practically the creator of one of the finest units, the 95th, in Moore's celebrated Light Div. It was in India under Baird that B., as a subaltern, learned military organisation, and when, on his return to England, a rifle corps or regiment of light troops was about to be formed, B. obtained a captaincy in the new unit, which later was known as Manningham's Rifles or the 95th of the Line (later the Rifle Brigade). B. became the lieutenant-colonel of this regiment in 1803, and the part that he and his brigade took in closing Moore's retreat from Portugal is graphically described by Napier. Subsequently he again distinguished himself in the Peninsular war, notably at Busaco and at Sabugal. In 1829 he was appointed Commander-in-Chief at Bombay, India.

Beckx, Pierre Jean (1795–1887), general of the Jesuits, b. Siehem in Brabant, and d. at Rome. He became confessor to the Duke of Anhalt-Köthen, and procurator for the prov. of Austria in 1847. Six years later he was made general of his order, and as such influenced Pope Pius IX. He took a prominent part in the discussions concerning the Immaculate Conception and papal infallibility.

Becon, Thomas (1512–67), Eng. divine, chaplain to Archbishop Craumer. He graduated as B.A. at the age of 16 at St John's College, Cambridge. His religious opinions caused his summons to London, there to recant them and further to burn the books wherein they had been proclaimed. During the reign of Edward VI he prospered, but was sent to the Tower on the death of the king. On being released he went to Strasburg. On Elizabeth's accession he returned, and was restored to his benefice of St Stephen, Walbrook.

Becontree, dist. of Essex, England, situated in the bors. of Ilford, Barking, and Dagenham, 11 m. from London. Here the L.C.C. has built dwellings to accommodate nearly 100,000 persons.

Beccue, Henri François (1837–99), Fr. dramatist, b. Paris. His realistic, often bitter plays, as *Michel Paupeur*, 1870, *L'Enlèvement*, 1871, *Les Corbeaux*, 1882, and *La Parisienne*, 1885, are now greatly esteemed, although B. had little success in his lifetime. See E. Dawson, *Henri Beccue*, 1920.

Bécquer, Gustavo Adolfo (1836–70), Sp. poet and man of letters, b. Seville, son of a painter. In 1854 he went to Madrid,

and earned a scanty living on trans. and miscellaneous journalistic work. He wrote 3 vols. of poems and prose legends. In the former he was imbued with the romantic spirit that influenced Byron and Heine; his theme is the hopelessness of love and the suffering in life. His diction is prosaic but expressive of deep feeling. His prose, *Leyendas*, are weird and morbid. B. d. of consumption at the age of 34. His works were pub. posthumously (2 vols), 1871. See B. Jarnés, *G. A. Becquer*, 1936.

Becquerel, Antoine César (1788-1878), Fr. physicist, b. Châtillon-sur-Loing; served in the Fr. army as an engineer in Spain, 1810; he was appointed to the École Polytechnique and served in France in 1814. He then left the army to study with Ampère and Biot (q.q.v.) magnetism, electro-conductivity, and more particularly electro-chem. In 1837 he became prof. of physics at the Musée d'Histoire Naturelle. The value of his researches in electrical science was recognised by the Royal Society with the Copley medal, 1837, and he may be regarded as one of the pioneers in the study of electro-chem. Of his numerous scientific pubs. the chief are *Traité d'électricité et du magnétisme*, 1840, *Éléments de l'électro-chimie*, 1843, *Traité complet du magnétisme*, 1845, and *Éléments de physique terrestre et de météorologie*, 1847.

Becquerel, Antoine Henri (1852-1908), Fr. physicist, b. Paris, grandson of Antoine César Becquerel (q.v.). Studied at the École Polytechnique and the École des Ponts-et-Chaussées. Followed his father as prof. at the Conservatoire des Arts et Métiers. He is famous for his discovery of radioactivity (q.v.) during researches on fluorescence, in 1896. His other work included studies of the magnetic rotation of the plane of polarisation of light. He shared the Nobel prize in 1903 with Pierre and Marie Curie for his work on radioactivity.

Becquerel Rays, invisible rays given off by uranium. The property of radioactivity of uranium was first discovered in 1896 by Antoine Henri Becquerel. See RADIOACTIVITY.

Beece, see BEESL.

Bective Abbey, anc. Cistercian monastery (1146) on the R. Boyne, 5 m. S. of An Uaimh, Rep. of Ireland.

Bed, term generally for the sleeping place for human beings or animals; specifically a piece of furniture used for sleeping. Primitive man made his B. upon the floor of a cave or hut, of skins, leaves, ferns, dried grass, or straw. E. nations pile sleeping-mats and rugs on the floor for night, and remove them in the day. The B. of the O.T. and N.T. can be seen to-day in the E. In India the string B. stretched on a low framework of wood, the *charpoy*, marks a transition towards the bedstead. The material of the bedding, straw, wool, or feathers, has not varied much since early times; hair was used in the Middle Ages. Pillows and bolsters were used in anc. Greece and Rome. The curved head-rest of wood or more costly material is found in anc.

Egypt, and to-day in Japan, in Africa, and the Pacific. In modern times flock, wool, horsehair are used for the stuffing of bedding; feathers, still used for pillows, have ceased to be a luxury for the B.; the spring mattress has given place to the coiled wire-woven net, fixed in the framework, a development of the crossed plate of iron or webbing descending from the hide thongs of anc. times which supported the bedding. Interior springing, and the use of rubber latex foam for mattresses and pillows are comparatively new. The bedstead proper in anc. Egypt was a low framework of wood, on which was stretched a webbing of rushwork or fibre; more lofty B.s. with steps, were used for persons of rank. The early Gk. B. had a head-board, and laced thongs of hide supporting a pile of skins or other coverings. Oriental influence brought carving and inlay of metal and ivory, which the Romans copied. At Pompeii have been found the carved bronze posts and head-rests of B.s. which once supported a narrow frame of wood; such were probably placed in an alcove and sheltered by curtains. In the early Middle Ages the bedstead, where used, appears to have been a box-like construction, but there are illustrations in MSS. of B.s. with carved and decorated head- and foot-boards; others are mere couches or benches placed against the wall with curtains hung from a side cornice. A feature of 12th- and 13th-cent. B.s. is their slope from head to foot. In the 14th cent. is found the tester, with canopy and side curtains usually hung from a wall projection at the head. It must be remembered that bedsteads were luxuries for the well-to-do, and that the common folk slept, as did their ancestors, on rushes, skins, or straw upon the floor. Till the end of the 15th and beginning of the 16th cent. most of the decoration seems to have been lavished on the H-trappings, which a great personage carried with him, to furnish the light frameworks of the permanent bedsteads. With the 16th cent. comes the great 4-post B., with its opportunity for the craft of the wood carver. Many fine examples of Elizabethan and Jacobean B.s. of this type still exist. A historic example is the great B. of Ware, once at the Saracen's Head, now in the Victoria and Albert Museum, London. The 17th cent. ended, a return was made to the tester, but the canopy and side curtains rest on the head-posts of the B., and the foot-board, carved and curved, remains or is dispensed with. France was before England in the change, and the 18th cent. in France produced ornate and beautiful examples. Chippendale and Sheraton designed fine mahogany bedsteads, and the present day has seen a revival of the taste for wooden bedsteads in preference to the iron and brass bedsteads which had come into use since the middle of the 18th cent., and the wide popularity of the divan head-board which is sometimes padded or covered with material matching the other B. coverings. See also FURNITURE.

Bed, in geology, term used to indicate

sedimentary layers of rocks, usually called strata. See GEOLOGY.

Bed of Justice, see LIT DE JUSTICE.

Bedale, markt tn and rural dist. of Yorks (N. Riding), England, 8 m. SW. of Northallerton. The B. hunt is named after the tn. Pop. 1050.

Bédarieux, Fr. tn, in the dept of Hérault. Bauxite is found, and there are textile manufs. Pop. 7000.

Bedda, or **Beda**, Nuts, product of *Terminalia bellerica*, family Combretaceae. These tropical seeds are used in medicines, and also in dyeing and tanning. In common with the seeds of sev. other plants they are called myrobalans.

Beddgelert, i.e. the grave of Gelert, vil., Caernarvonshire, N. Wales, 13 m. SE. of Caernarvon. It is close to the pass of Aberglaslyn, in which is the rock called the chair of Rhys Goch, the bard (d. 1420). From the vil., lying at the foot of Snowdon, the ascent can be made. Pop. 1100. The traditional grave of Llewellyn's hound, Gelert, is marked by a stone, recalling the legend of the hound who saved his master's child from a wolf and was killed in mistake by the father. Pop. 913.

Beddington, dist. of Surrey, England, part of the bor. of B. and Wallington, on the Wandle, 2 m. from Croydon. It has a public park, and, adjoining it, a school which was formerly the seat of the Carew family. Pop. 19,338.

Beddoe, John (1826-1911), anthropologist and physician, b. Bowdley, Worcs. He was educ. at Univ. College, London, and Edinburgh. He served during the Crimean War as a doctor on the civil staff, and from 1857 had a medical practice in Clifton, Bristol. His anthropological works include *The Races of Britain*, 1885, *Stature of Man in British Isles*, 1870, and *The Anthropological History of Europe*, 1910.

Beddoes, Thomas (1760-1808), physician, b. Shifnal, Shropshire. Educ. at Pembroke College, Oxford, he studied languages, chemistry, and geology, then came to London, 1781, and studied medicine under Sheldon. He took his M.D. at Oxford, 1786, and visited France in the following year. At the outbreak of the Fr. Revolution, he supported the rebels, and in consequence had to leave Oxford. He returned to Shropshire, and wrote the *History of Isaac Jenkins*, intended to check drunkenness. In 1794 he married Anna Edgeworth, sister of Maria Edgeworth (q.v.). He was the inventor of a 'pneumatic' system of therapeutics by inhalation of medicated gases, and set up an institution, which is notable as having provided Humphry Davy with opportunities for his researches. See life in F. F. Cartwright, *The English Pioneers of Anaesthesia*, 1952.

Beddoes, Thomas Lovell (1803-49), poet, b. Clifton, the son of Thomas B. (q.v.). He was educ. at Charterhouse and Pembroke College, Oxford. His poetic drama, *The Bride's Tragedy*, 1822, is modelled on Webster and Tournear, and his verse re-echoes that of the Jacobean dramatists. His fantastic and

amorphous drama in verse, *Death's Jest-book*, or *The Fool's Tragedy*, was pub. posthumously, 1850, by his friend, T. F. Kelsall, who was his literary executor, and in 1850-1 pub. a memoir of B. and collected eds. of his poems. Many of B.'s lyrical poems, such as 'If there were dreams to sell,' are exquisite. From 1824 till his death B. lived a wandering life abroad, chiefly in Germany and Switzerland, but his revolutionary views prevented his remaining long in one place. He committed suicide under peculiar circumstances in 1849 at Basel. See E. Gosse, *Poetical Works of T. L. Beddoes*, 1890, 1928, with the first full account of his life, and *Letters*, 1894; R. H. Snow, *Thomas Lovell Beddoes, Eccentric and Poet*, 1928; H. W. Donner, *Thomas Lovell Beddoes: the Making of a Poet*, 1935.

Bede, **Beda**, or **Bæda**, surnamed **The Venerable** (c. 673-735), historian, b. in the ter. of the monastery of St Peter at Wearmouth. When 7 years old he was admitted to this monastery, and studied under Benedict Biscop (q.v.) and his successor, Ceolfrid. In 682 Biscop founded the neighbouring monastery of Jarrow, and it is here that B. generally resided. In his nineteenth year he was admitted to the diaconate by St John of Beverley, then Bishop of Hexham, and 11 years later the same bishop ordained him priest. At the end of his *Ecclesiastical History* B. gives us these particulars of himself, and goes on to mention how the observance of the monastic discipline, the daily charge of singing in the church, and the delights of learning, teaching, and writing had made up his tranquil life. B. was fortunate in his environment; he was able to draw on the vast library collected by Biscop, and there is no evidence that he himself ever travelled beyond York and Lindisfarne. Yet the scope of his writing is enormous. His learning was great, covering, though probably not so fully as has sometimes been supposed, almost all the subjects then known: Latin, Greek, astronomy, medicine, and possibly some Hebrew. His *Ecclesiastical History* is a chief source of knowledge of the early hist. of England. Its facts are derived partly from the Rom. writers, but also from local sources and traditions. King Alfred trans. it into Anglo-Saxon. B. also wrote scientific works, including a treatise on the calendar, and other historical essays, such as the *History of the Abbots* of his own monasteries. Another large div. of his work consisted of theological treatises and biblical commentaries. B. possessed the gift of co-ordinating the facts at his disposal into a vivid historical pattern, and this gift, combined with his real critical faculty, has helped his historical writing to stand the test of time. Though never canonised, the title *Venerable* was added to his name in the 9th cent. Leo XIII pronounced B. a doctor of the Church in 1899.

Bede, Cuthbert, see BRADLEY, EDWARD.
Bedeau, Marie Alphonse (1804-63), Fr. general, b. and d. Vertou, near Nantes. He was sent to Algeria in 1836, and in

1847 became its governor-general for some time. During the revolution in 1848 he was appointed, by Marshal Bugeaud, commander of one of the 5 columns for its suppression, but proved of little service. He was arrested with Cavaignac and La Moricière in 1851 and banished, but in 1859 returned to his native land.

Bedeaux System, also known as B. point plan, a wage incentive system based on a form of job standardisation covering direct and indirect production work. The employee receives a basic hourly wage until his efficiency exceeds a standard fixed in advance by time study. Production in excess of standard is rewarded by an increasing hourly rate strictly related to production, until for high production it becomes almost a pure piece rate. Thus, if production is 150 per cent of standard, the daily wage earned is 140 per cent of the basic daily wage. The system is similar in principle to other incentive systems involving the 'sharing' of savings resulting from super-standard production between employer and employee. The application is usually accompanied by the fixing of high standards and the exercise of rigid control, but is not concerned with production methods, and has therefore led to industrial disputes and considerable controversy.

Bedegar, or **Bedeguar** (Persian 'wind-brought'), or Robin's Pincushion, gall consisting of moss-like filaments, greenish but later reddish, enclosing a cluster of cells containing grubs of the Gall-wasp, *Rhodites rosae*, responsible for it; found chiefly on wild roses. See GALLS.

Bedel, see BEADLE and LOCAL GOVERNMENT.

Bedell, William (1571-1642), Eng. prelate, b. Black Notley in Essex. Took holy orders and was chosen fellow of his college, Emmanuel, Cambridge; was chaplain to Sir Henry Wotton at Venice. On his return to England he trans. into Latin various works concerning the hist. of the Church. In 1627 he became provost of Trinity College, Dublin, and in 1629 was elected Bishop of Kilmore and Ardagh. He also aided in the trans. of the Prayer Book and Bible into Erse, and saw that the trans. was read in his diocese. In the rebellion of 1641 he was at first unmolested, but afterwards imprisoned, in consequence of which he d.

Bedesman, or **Beadsman**, almsman, who offered *bedes* or prayers for his benefactor's soul. Our word bead is derived from *bede*, a prayer counted upon the beads of a Rosary. Bedesmen were attached to the churches. In Scotland the king's bedesmen were licensed mendicants, who received maintenance in kind on the king's birthday. Later the word came to mean a pensioner, or the inmate of a hospital. See also BIDDING PRAYER.

Bedford, Dukes of, see RUSSELL FAMILY.

Bedford: 1. Co. tn of Beds, England, and a municipal and Assize and Quarter Sessions bor. It is situated on the R. Ouse, amid fertile pasture lands and cornfields, about 50 m. from London. The

riv. banks are tastefully laid out as promenades, and there are 3 large parks. There is considerable trade in market garden and agric. produce. Engines and agric. machines are manuf. Sir W. Harpur (d. 1573), lord mayor of London in 1561, is buried in St Paul's Church. He did much to benefit B., his native place, and endowed an Edward VI grammar school, and the 'Harpur Trust' supports B. School and other schools for boys and girls. The name of John Bunyan is associated with the tn. He was imprisoned in the jail; his chair is preserved at the Bunyan meeting house on the site of the chapel in which he preached. Pop. 53,000.

2. City, co. seat of Lawrence co., Indiana, 22 m. S. of Bloomington. It is a shipping port for the B. oolitic limestone, the best building stone in the U.S.A., of which many important buildings have been constructed. Manufs. include stone-working machinery. Pop. 12,600.

Bedford College, school of London Univ. (q.v.), founded in 1849 by Mrs Reid to provide a liberal education for women. The original buildings were in Bedford Square; a move followed to York Place, Baker Street, and in 1913 new buildings in Regent's Park were opened by Queen Mary. There are some 700 undergraduate and 100 postgraduate students.

Bedford Level, dist. in England of about 400,000 ac., situated in the eos. of Suffolk, Norfolk, Lincs, Cambs, Northants, and Hants. It was once fenland, and was first drained in the 17th cent. by the Dutch engineer Cornelius Vermuyden for a group of speculators headed by the Earl of Bedford. A large portion is under cultivation, and coleseed and flax are grown. Wildfowl live in the more marshy dists. in vast numbers.

Bedford Park, residential dist. in the bor. of Acton, Middx, the first London suburb (begun 1875) to be planned. See also HAMSTEAD GARDEN SUBURB.

Bedfordshire, S. midland co. of England, bounded by Northants on the NW., Bucks on the W., Herts and Hants on the E., and Hants on the NE. The surface is generally level, but a branch of the Chiltern Hills crosses the NE. and S. of the co. The prin. rivs. are the Great Ouse, flowing through the centre of the co. to the E. (navigable to Little Bardford), and its trib. the Ivel. The valley of B. is fertile, and the Ouse valley is noted for its pastures. Wheat and barley are grown, and the E. of the co. is largely given up to market gardening. Chief industries are engineering and motor works at Luton and Dunstable, printing at Dunstable, and extensive cement manufs. on the chalk. The world's largest brickworks are at Stewartby. The co. comprises 3 bors., and 5 urb. and 4 rural dists., and returns 3 members to Parliament. Area 302,942 ac.; pop. 312,000. See pubs. of the B. Historical Record Society (1912-); the B. Magazine (1947-); Victoria Co. Hist. of B., 1912-1914; C. G. Chambers, *Bedfordshire*, 1917; A. Mee, *Bedford and Huntingdon*, 1938.

Bedfordshire and Hertfordshire Regiment, The (formerly 16th Foot), regiment of the Brit. Army, raised in 1688 and sent to Holland in 1689, serving in all campaigns down to peace of Ryswyck, 1697. After a few years in Ireland it returned to Holland under Marlborough and fought at Blenheim, Ramillies, Oudenarde, and Malplaquet. In 1782 it received the title the Buckinghamshire, which it exchanged in 1809 for the Bedfordshire. During the 19th cent. it served in the W. Indies, Ceylon, Bengal, and N. America. Under Sir R. Low it served in the Chitral campaign in 1895. During the First World War it raised 18 battalions for service in France, Flanders, Italy, Gallipoli, and Palestine. In 1919 the title was changed to the Beds and Herts Regiment. Units of the B. and H. R. fought in NW. Europe in the Second World War. Other units also fought on the It. front, and in Burma.

Bédier, Joseph (1864-1938), Fr. writer, b. Paris; one of the foremost authorities on Fr. medieval literature, having a gift for moulding legend and tradition into literary forms of grace and distinction. He was prof. of Fr. literature at Fribourg (1889-91), at Caen (1891-3), and at the Collège de France (1893-1925), being administrator of the last-named from 1925 until his death. Pubs.: *Le Roman de Tristan et Yseult*, 1900-20; *Les Chansons de croisade*, 1909; *La Chanson de Roland*, 1921-6; *La Formation des légendes épiques*, 1908-17. He was elected to the Académie Française in 1920 in recognition of his *Histoire de la littérature française*, 1923.

Bedivere, last knight of King Arthur's Round Table. His adventures are recounted in the *Morte d'Arthur* of Malory. It was Sir B. who bore Arthur's body to the barge and hurled his sword *Excalibur* into the lake.

Bedlam (properly **Bethlem Hospital**), London co. mental hospital, originally founded in 1247 by Simon Fitzmary as a priory at Bishopsgate under St Mary's of Bethlehem. Later converted into a 'madhouse,' and transferred in 1676 to Moorfields, then in 1815 to Lambeth. At one time the inmates were treated in a cruel manner, being exhibited as though they were wild beasts. Hogarth's picture refers to this. 'Bedlam beggars' or 'Tom-o'-Bedlams' were names given to such patients as, being partially cured, were allowed to go at large. In 1931 the hospital was moved to Beckenham, Kent, and the grounds on which it stood were given by Lord Rothermere as a playground for S. London children, while the building in Lambeth now houses the Imperial War Museum. See E. G. O'Donoghue, *The Story of Bethlehem Hospital*, 1914.

Bedlington Terrier, so named after the tn of Bedlington in Northumberland. It was first bred there at the beginning of last cent., and was for some time only known to the miners of the dist., with whom it was, as now, a favourite sporting dog. It stands about 13 in. and weighs from 18 to 24 pounds; colour blue-black,

with black nose, or liver, tan, or sandy with light-coloured nose; the coat is short, crisp, and inclined to harshness; the head is narrow, the muzzle long and powerful; ears set low, and falling close to the head; tail tapering and not carried high; the legs are long and flanks cut up. The B. T. is a splendid ratter, and full of courage and fight, with remarkable speed.



T. Fall

BEDLINGTON TERRIERS

Bedlingtonshire, urb. dist. of Northumberland, England. It is situated 4 m. above the mouth of the Blyth. It has collieries, brickworks, and light industries. Pop. 28,270.

Bedloe's Island, in New York harbour, U.S.A., lying, together with Governor's and Ellis Is., in the bay S. of Manhattan Is. In it stands the famous statue of Liberty, presented to the nation by France, which dominates New York harbour.

Bedmar, Alfonso della Cueva, Marqués de (1572-1655), Sp. diplomat. He was appointed to Venice in 1607 to break up a Franco-Swiss-Dutch-Venetian league against Spain. The plot that he was supposed to have planned, in 1618, with the Viceroy of Naples, the Duke of Ossuna, to capture the city during the Ascension Day ceremony of the doge's marriage with the Adriatic, is the basis of Otway's tragedy, *Venice Preserved*. He left Venice on its discovery and went to the Netherlands as president of the council. He became a cardinal in 1622, and Bishop of Oviedo, where he died.

Bednyy, Dem'yan (real name **Pridvorov, Yefim Alekseyevich**) (1883-1945), Russian Communist poet. His simple verses were very popular during the civil war and in the 1920's, when he was held up as the prin. proletarian poet.

Bédos de Celles, Dom François (1709-1779), Benedictine monk of Saint-Maur,

b. Canx. He was a master in the knowledge of organ-building, and pub. *L'Art du facteur d'orgues* in 1786 to 1778.

Bedouins, i.e. the people of the open land or desert, Arab. *Ahl-bedw*, *Badawin*, or, as they also call themselves, *Ahl-el-bell*, the people of the tent. According to Arab traditional ethnology, the B. are Mustarabs, naturalised Arabs, the descendants of Ishmael, as distinguished from the pure Arabs descended from Shem; thus the latter are the agric. settled Arabs, the B. the nomad pastoral people. The earliest home of the B. was N. Arabia, Hejaz, and Nejd, from whence they spread in early times to Syria and Mesopotamia, and much later to Egypt and Tunisia. The name has lost much of its true racial significance, for it is often applied to many Hamitic nomad tribes, such as the Bisharin and Hadendoes in Lower Egypt and the Sudan, while true B. have settled in vils. and become agric. Physically the B. of N. Arabia are slight and wiry rather than strong, and below the middle height; in colour brown, deepening in shade in the S. The features are good, with aquiline nose. Their organisation is tribal, their leader the sheikh, chosen for his qualities, whether of wealth, birth, or courage. Living in tents and moving from well to well and pasture to pasture, the B. are loosely organised; intertribal feuds are common, with constant cattle raidings. They were notorious plunderers of caravans and travellers, and a regular toll was paid by the Turkish gov. to those tribes through whose ter. passed the pilgrimages to Medina and Mecca. The building of the Hejaz railway caused much disturbance in consequence among the tribes. Regarding all travellers as trespassors, they nevertheless respected a safe conduct or passport which could be obtained from a sheikh by payment. The proverbial Arab hospitality was then freely extended. Though professing Mohammedanism, they are by no means strict observers, except under pressure from the Wahabis, as in Nejd. Polygamy is rare, but the marriage tie is loose. The dress of the men consists of a long shirt and a black camel's-hair cloak, with a black or striped headcloth; the women wear white trousers and shirt, with a large blue cloak which they draw over the face before strangers. The chief authorities are J. L. Burckhardt, *Notes on the Bedouins and Wahabis*, 1831, C. M. Doughty, *Arabia Deserta*, 1882, W. S. Blunt, *Bedouin Tribes*, 1879, Lady Anne Blunt, *Pilgrimage to Nejd*, 1881, Hill Gray, *With the Bedouins*, 1890, S. M. Zwemer, *Arabia, the Cradle of Islam*, 1900, and A. Kennett, *Bedouin Justice*, 1925. See also bibliography under ARABIA.

Bedruthan Steps, remarkable natural granite formations on the N. Cornish coast, England, 5 m. from Newquay.

Bedsore, sore or type of ulceration which may afflict a patient who is confined to bed through illness, accident, or old age, especially if unable to move freely and often. Constant pressure on one surface causes a loss of vitality to the surrounding tissues through stoppage of the

circulation, and results, if neglected, in a discoloration of the skin, then a slough, and finally a deep ulcer. The parts most liable are the base of the spine, the hips, shoulders, heels, and elbows, and the back of the head. The tendency to rapid formation of B. varies with the weight of the patient, his capacity to move, etc., but want of cleanliness, the wetting of bedclothes and bedding from perspiration and excretions, ruckled or untidy sheets are the chief exciting causes. A patient should, therefore, be kept scrupulously clean, and washed with soap and water daily, all damp clothing at once changed, the sheets kept smooth, and the parts liable rubbed briskly; the skin on these parts should also be rubbed with methylated spirits, and dusted with boracic acid or prepared starch powder. A water-bed or an air-cushion for the exposed parts is a good protection and of the utmost use if a bed sore has formed. Should a slough form, continued fomentations will bring it away, when the sore can be dressed with boracic ointment, or if persistent in not healing, friar's balsam, red lotion, or zinc ointment may be applied; an ointment containing gentian violet is now often used for B. and other skin troubles.

Bedstead, though applied originally to the place in which a bed was located, is a term now employed to indicate the framework of the bed. See BED.



HEDGE BEDSTRAW

Bedstraw, name of the genus of Rubiaceae known as *Galium*, related to wood-ruff and madder. *G. aparine* is often called goose-grass or cleavers; *G. verum* (yellow or lady's bedstraw), *G. mollugo* (great hedge bedstraw), and *G. cruciatum* (crosswort) are common in Britain.

Bedwellty, par. of W. Monmouthshire, Wales. It is situated 7 m. W. of Pontypool, and has coal-mines and iron foundries. Pop. 28,560.

Bedworth, tn of Warwickshire, England, 5 m. from Coventry, on the Nuneaton-Coventry branch of the railway. The Coventry Canal serves it for the carriage of its coal and ironstone mined there, and there are brickfields, a colliery,

and light industrial concerns. Pop. 25,000.

Bedzin (Ger. *Bendzin*; *Bendsburg*), tn of Poland, in Stalinogród prov., 7 m. NE. of Stalinogród (q.v.). It is in an important coal-field, and has metallurgical and chemical industries. Pop. 29,000.

Bee. The B.s form a group of six-legged, four-winged insects of the order Hymenoptera. There are about two hundred and fifty varieties of B.s in Britain, most of them 'solitary' insects. Honey B.s, *Apis mellifica* (as distinct from the bumble (*bombus*) B.), are of great antiquity, and many mythological and biblical references to them exist. The honey B.s, which are 'social' insects, weigh about 4000 to the pound (lb.). They have a head with compound eyes, antennae, a mouth with mandibles for chewing, and a tongue adapted for sucking nectar. The head is joined to the thorax by a short neck. The abdomen is attached to the thorax by a narrow waist (see Plate, E, F, G (twice normal sizes)). The antennae, or feelers, are the sensory organs, being concerned with smell and touch. B.s have an ovipositor, which is used as such by the queen, but is adapted as a sting in the workers: drones do not sting.

A 'colony' consists of 40,000-50,000 B.s; of this total there is one queen (female) and about 300 drones (males), and the remainder are workers (undeveloped females). The colonies usually live in wooden hives provided by the beekeeper, but are sometimes found in hollow trees, wall cavities, beehives, and similar places.

A queen B. lives for sev. years, reaching her prime, usually, in the second or third egg-laying season. She reaches a peak output of more than 2000 eggs per day in the season mid Jan. to mid June; after this there is a steady fall, until laying eventually ceases in mid Sept.

Eggs which are laid before 'mating' are fertile, but are not impregnated with male sperms; after mating, the impregnated eggs, from which workers are hatched, are laid in worker cells, and the unimpregnated eggs, which eventually hatch into drones, are placed in slightly larger cells. The cells are hexagonal in shape and are built horizontally at each side of vertical midribs of wax, which hang parallel to one another (see Plate, C, D). The impregnated eggs will produce queens only when they are placed in acorn-shaped cells, hanging from a comb, and when the larvae are fed with a special richer food called by beekeepers 'royal jelly.'

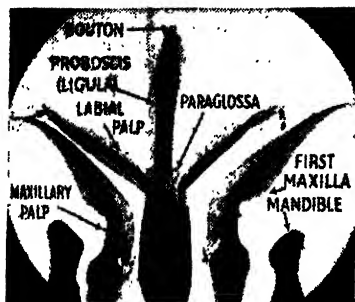
The eggs hatch in three days. The larvae are fed for five days; then, after five sheddings of skin, they begin to spin cocoons. The cells are then sealed with porous cappings. Inside, the larvae develop into pupae; each pupa then becomes an imago; and finally the complete insect emerges, after biting away the capping. The whole process, from the actual laying of the egg, takes 15 days in the case of a queen; for a worker 21 days, and for a drone 24 days. It is usual for sev. queen cells to be built at the same time. The first queen to emerge inserts her

sting (which is only used against other queens) into the other queen cells, thus killing the occupants. When the young (virgin) queen meets the old queen, she will fight and kill her; but there have been rare cases of two queens in one hive. The young growing B.s perform numerous duties: they clean their cells, feed the larvae, and fly on about the seventh day. They receive, and store in the cells, the nectar, pollen, and propolis brought to the hive by the foragers; and on about the twentieth day they become foragers themselves. In this way the worker B.s are gathering nectar and pollen six weeks after the laying of the egg. The drones develop but do no foraging; they feed, help to regulate the temp. of the hive, and may 'mate' with the queen. In the autumn, when they are no longer needed, the drones are killed by the workers; only the workers and the queen 'winter.'

When about six days old the queen leaves the hive on the mating flight. Her 'scent' is picked up by the drones, and one drone mates with the queen in flight, usually a few yards from the hive. In the mating act the drone's genital organs are torn out by the queen, who then returns to the hive, where she is cleaned by attendant worker bees. Normally she does not emerge from the hive again except with the 'swarm,' although some observers think that there may be further matings. The ruptured drone dies. The mated queen, her spermatheca filled with drone semen, which develops the spermatozoa with which the worker eggs are impregnated, is influenced in her egg output by an urge from within the colony. Instrumental insemination of queen B.s is now successfully practised.

The worker B.s suck the nectar from the flowers of plants and trees, and store this in their sacs. When they return to the hive they pass the nectar, by regurgitation, to other workers, who store it in cells. Pollen and propolis (to seal unwanted openings in the hive) are carried in *corbiculac* (pollen baskets), which are found on the third pair of the B.'s three pairs of legs. Nurse B.s eat pollen and honey; this enables them to produce, from glands in the neck, a creamy larval food, and with this they feed the larvae. Honey is consumed by the wax-makers. High temps. are achieved by the B.s hanging in clusters; and wax scales, which extrude from eight pockets under the abdomen, are manipulated in the mandibles (see Plate, A), and used by the comb builders to make cells. B.s in their natural state increase by swarming (see BEEKEEPING). Von Frisch's theory, that B.s dance on combs to indicate the direction and source of nectar, is now well estab.

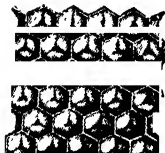
Worker B.s, when frightened, use the sting at the end of the abdomen in self-defence. B. venom is momentarily painful and is followed by irritation and swelling; it is seldom serious, though the shock caused by stinging may be very dangerous. Contrary to general belief, B.s need not die after stinging, although they generally do so. This is because the sting barbs hold



A



B



E



G

THE HONEY-BEE

A, mouth parts; B, the sting; C, waxen cells in section; and D, in elevation; E, female (queen); F, male (drone); G, unfertile female (worker).

fast when the B. tears itself away or is flicked off. If given time, the B. will turn round to roll up the barbs, withdraw the sting, and fly away.

The life of a worker B. in the foraging season is seldom more than six weeks, but B.s born in Sept. 'winter' ready to begin the build-up of the colony in spring. Queen B.s, if not naturally superseded, are usually replaced by the beekeeper in the third year of life.

Diseases can be controlled by good management. *Foul brood* is the disease

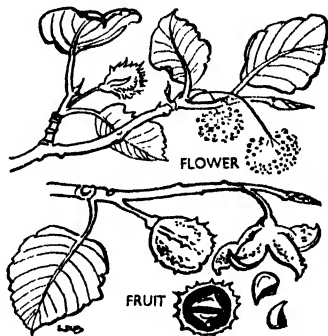
which is most feared by apiarists. The larvae become discoloured, and can be drawn out from sunken-capped cells as a putrefied substance by inserting and twisting a matchstick. Foul brood is a notifiable disease, and if a colony is infected B.s, combs, and frames are burnt, and the hive woodwork is scorched, to destroy spores of the disease. Normal larvae are pearly-white. Recent experiments with drug treatments, particularly with sulphonamides, suggest that it may soon be possible to avoid the destruction

of the B.s. Other variants of this disease include *chilled* and *sac brood*. *Acarine* (Isle of Wight) is a disease which almost destroyed B. life in Britain some years ago. B.s breathe through spiracles into tracheae and a mite (*Acarapis woodi*) sometimes enters the tracheae and breeds there, thus destroying the B. The cure for acarine is 'frowing' with nitro-benzene fumes. A preventive—methyl salicylate fumes—can be introduced into hives on saturated pads. Paralysis and dysentery sometimes attack B.s. *Braula coeca*, the B. louse, is a pest about the size of a pin-head which fastens itself to the thorax of the B. and sucks up the body juices. Wax moths in hives are also seriously destructive.

In order to obtain the maximum honey production, strain of B. is all important. The Brit. black (dark brown) B. is now rare. Most B.s in Britain are hybrids from Carniolan, Caucasian, Dutch, Fr., and It. B.s. Among the 'solitary' B.s are: *Bombus* (see HUMBLE BEE), which nests among stones or in the ground; *Prosopis*, a small, black, hairless B. that gorges itself with nectar and pollen and regurgitates it into its cells in stems or wall cavities; *Andrena*, most of whose 60 species are partial to dandelion flowers and burrow in sandy soil; *Osmia*, which is like the hive B. and often called the 'mason B.' These B.s fasten together tiny pebbles and other materials with saliva in order to form nests; *Anthophora*, a long-tongued B. like a small bumble B. which nests in walls and ground banks; *Megachile*, a leaf-cutting B., which nips pieces from rose leaves and petals to line its nests; *Anthidium*, the carder B., which shaves the fine hairs from down-covered stems and leaves to line its burrow; *Xylocopa*, the carpenter B., a large B. which bores into wood, sometimes tunnelling 12 in., and then dividing the tunnel into cells in which to lay eggs and store honey and pollen. Among foreign B.s are *Apis dorsata*, which has combs 5 ft in length; the Asian *A. indica*; *A. florea* in the W. Indies; and the *A. adansonii* of W. Africa. See also BEEKEEPING and HUMBLE BEE. See W. E. Kelsey, *The Spell of the Honey Bee*, 1945; G. A. Carter, *Bees and Honey*, 1945; A. D. Imms, *Insect Natural History*, 1947; J. G. Digges, *The Practical Bee Guide*, 1949; H. G. Mace, *Bees, Flowers, and Fruit*, 1949; C. R. Ribbands, *The Behaviour and Social Life of Honeybees*, 1953; C. G. Butler, *The World of the Honeybee*, 1954.

Bee-eater, typical genus *Merops* of the family Meropidae, which has an extensive range over Africa, India, and Australasia. They are slender birds, with long bill and pointed wings, with a flight like a swallow, which in shape they resemble. They are brightly coloured, green predominating. They feed on bees, wasps, and other insects. The European B. is *Merops apiaster*, which migrates from Africa, where it breeds, to S. and central Europe; it nests in colonies in holes dug out by its long bill in sandy river banks. It is rarely seen in Great Britain.

Beebe, Charles William (1877-), Amer. ornithologist, b. Brooklyn, New York. Educ. Columbia Univ. Appointed, 1899, curator of ornithology, New York Zoological Society. Organised the collection of birds, New York Zoological Park. Has headed many expeditions in both hemispheres. Among his numerous pubs. are *Two Bird-lovers in Mexico*, 1905, *The Bird: its Form and Function*, 1907, *Tropical Wild Life in British Guiana*, 1917, etc., *Monograph of the Pheasants*, 1918-22, *Galapagos, World's End*, 1924, *The Arcturus Adventure*, 1926, *Beneath Tropic Seas*, 1928, and *Half Mile Down*, 1935.



Beech, *Fagus sylvatica*, is widely distributed throughout Europe and is native to Britain. It is also found in Asia Minor and Japan. It is a very tall tree, often attaining a height of 100 ft or more and frequently has a trunk clear of branches for 50 ft to 60 ft, when grown under forest conditions. The timber is usually straight grained and shows little or no difference between the heartwood and the sapwood. It is characterised by small spindle-shaped markings on plain-sawn boards which are caused by the rather prominent rays. It weighs about 46 lb. per cu. ft. when seasoned. B. is one of the strongest of Brit. timbers, being 20 per cent stronger than oak in most strength properties. It is not resistant to decay, but is one of the easiest timbers to impregnate with preservatives. It is one of the best timbers for turnery and for this reason is used widely for chair legs, cheap tool handles, kitchen utensils, brush backs, and other small household articles. It is also the commonest wood for ladies' shoe heels. The timber bonds readily on steaming which makes it valuable for such purposes as bentwood furniture. The prin. uses for beech are furniture, flooring, turned articles, motor-body framing, textile bobbins, toys, and cabinet making. Although the trees may grow to a height of 100 ft they are often grown in a stunted form, and clipped to make hedges. The flowers appear only

every few years, the male flowers forming pendulous catkins, while the females grow in pairs with a mass of scales, which later develop into a cupule enclosing 2 nuts. The copper and purple ls. are well-known varieties of *F. sylvatica*. See FORESTRY-TIMBER; TREE.

Beecham, Sir Thomas, 2nd Baronet (1879-), Eng. musical conductor, son of Sir Joseph B., 1st Baronet, and grandson of Thomas Beecham, who founded Beecham's Pill business, St. Helen's, Lancs. B. was educ. at Rossall School, Fleetwood, where he was taught harmony by Edward Thomas Sweeting; and at Oxford (Wadham College), where he had lessons from J. V. Roberts. He conducted an amateur orchestra, collected by himself, at Hurlton, 1899; and in 1905 he became known as a conductor in London, where he founded the New Symphony Orchestra, the B. Symphony Orchestra, 1908, and the London Philharmonic Orchestra, 1932. In 1910 he became lessee of Covent Garden theatre, and entered upon production of opera. It was he who first produced Russian ballet in England, 1911, and who introduced many important works and fine artists to the Brit. public. He was knighted in 1915 and succeeded to the baronetcy the following year. He continued to give opera throughout the First World War, at heavy loss to himself. He made great efforts to establish opera permanently in England, and it was from his company that the Brit. National Opera Co. was formed in 1922. He continued to conduct with brilliant success, not only in Britain, but as a star guest in many European countries and America. He pub. *A Mingled Chime* in 1944. See COVENT GARDEN THEATRE.

Beechdrops, or Cancer-root (*Epiphegus virginiana*), parasitic herb of the order Orobanchaceae; found in the roots of beech-trees in N. America.

Beecher, Charles (1815-1900), Amer. Congregational minister, the fourth son of Lyman B., and brother of Harriet Beecher Stowe. He officiated as pastor of the Second Presbyterian Church, Fort Wayne, Indiana, 1844-51; First Congregational Church, Newark, New Jersey, 1851-4; First Congregational Church, Georgetown, Massachusetts, 1857-81. He d. at Haverhill, Massachusetts. He ed. his father's letters and autobiography (2 vols.), 1864-5. Author of *Pen Pictures of the Bible*, 1855; *Spiritual Manifestations*, 1879; *The Eden Tableau*, 1880.

Beecher, Henry Ward (1813-87), Amer. Congregational minister, son of Lyman B. and brother of Harriet Beecher Stowe, b. in Connecticut, 24 June. He graduated in 1834 at Amherst College, Massachusetts, and later read theology under his father at the Lane Theological Seminary, Cincinnati. In 1847 he became pastor of Plymouth Congregational Church, Brooklyn, New York. He was one of the founders of the *Independent*, which he ed. in 1861-3. He favoured the Republican candidates in the presidential contests of 1856 and 1860, and, on the outbreak of civil war, his church raised a volunteer

corps for active service. From 1870 to 1881 he ed. the *Christian Union*. The chief of his pub. writings are *Star Papers*, 1855, *New Star Papers*, 1858, *Lectures to Young Men*, 1844 (revised ed. 1850), *Aids to Prayer*, 1864, *Norwood, or Village Life in New England*, 1867, *Yale Lectures on Preaching* (3 vols.), 1872-4, *The Life of Jesus the Christ* (2 vols.), 1871 and 1891, and *Evolution and Religion*, 1885. See his life by Joseph Howard jun., 1887; and a biography by W. C. Beecher, Rev. S. Scoville, and Mrs Beecher, 1888; also his *Autobiographical Reminiscences*, ed. by Ellinwood, 1898.

Beecher, Lyman (1775-1863), Amer. Presbyterian minister, father of Harriet Beecher Stowe. He was among the foremost preachers of his time. In 1832 he was appointed president of Lane Theological Seminary, near Cincinnati, a position which he held till 1850. He was arraigned for heresy, but was acquitted and became the recognised leader of the new school of the Presbyterian Church. His autobiography and letters were ed. by his son, Charles B. (1864-5).

Beecher Stowe, Harriet, see STOWE.
Beechey, Frederick William (1796-1856), Eng. admiral and geographer, was the son of Sir Wm B., the painter. He was with Franklin in the N. Polar expedition of 1818, and with Parry in 1819, and co-operated with them in 1825. Beechey Is., in Barrow Strait, is named after him. He was on the Mediterranean N. African survey, 1821; S. Amer. survey, 1835; and Irish coast survey, 1837-47; and was president of the Marine Dept at the Board of Trade, 1850. Promoted rear-admiral, 1854. President of the Royal Geographical Society. Wrote *Narrative of a voyage to the Pacific and Beechey's Strait* . . . 1825-28, 1831, and *A voyage of discovery towards the North Pole*. . . 1818, 1843.

Beechey, Sir William (1753-1839), portrait-painter, b. Burford. He attended the Royal Academy as a pupil in 1772. In 1793 he became an associate of the Academy, and in that year also he was chosen to be portrait-painter to Queen Charlotte. He was rewarded with a knighthood and the title of R.A. in 1798 for his picture of a review of cavalry, in which he portrayed George III, the Prince of Wales, and the Duke of York.

Beechey Island, in the Canadian Arctic Archipelago, lying off Devon Is. in Barrow Strait, lat. 74° N., long. 92° W. On it have been erected various memorials to Arctic explorers, including one to Franklin, who wintered on the is. in 1845, and one to Lt. Bellot, who d. with a Brit. expedition in 1853. Mean temp. about 3.5° F.

Beeching, Henry Charles (1859-1919), author and divine. He became canon of Westminster Abbey, 1902-11, and dean of Norwich, 1911. He was select preacher at Oxford Univ., 1896-7, and 1912-13, and at Cambridge, 1903, 1909, 1912; prof. of pastoral theology, King's College, London, 1900-3, and chaplain of Lincoln's Inn, 1900-3. His numerous pubs. include *Love in Idleness*, 1883, and

Love's Looking-Glass, 1891 (in collaboration with 2 others), *In a Garden, and other Poems*, 1895, *Religio Laici*, 1902, *The Grace of Episcopacy*, 1906, *Francis Atterbury*, 1909, and *Revision of the Prayer Book*, 1910.

Beeching, James (1788-1885), inventor, b. Bexhill, near Hastings, England. He went to Flushing, where he built the famous *Big Jane*, a smuggling craft. He won £1000 as a prize for his invention of a self-righting lifeboat.

● **Beechworth**, tn and mt holiday resort in Bogong co., Victoria, Australia. It is the centre of the Ovens gold area. Pop. 2600.

Beeding, Francis, see SAUNDERS, HILARY AIDAN ST GEORGE.

Beef, term applied to the flesh of an ox, bull, or cow when killed. Prepared in different ways, it serves as food in many countries. See COOKERY.

Beef-tea, extract of beef, used as a valuable stimulant and restorative in cases of illness. It consists of the blood and juices of the meat, but little of the albumen and gelatinous constituents, such as are contained in various commercial meat extracts.

Beef-wood, very hard and durable wood that makes excellent timber. It is so called because it resembles raw beef in colour. The name is applied to trees of 2 different genera—the *Swartzia*, belonging to the family Leguminosae, in Guiana, and the *Casuarina*, in Australia.

Beekeeper, see YROMAN OF THE GUARD.
Bee Steak Clubs, certain London clubs, formed for social purposes, where the refreshment was limited to steaks, with beer or wine. The earliest of these was founded in 1709, and included the wits and chief men of the day, with Richard Estcourt, the actor, as provost. The 'Sublime Society of Steaks,' founded in 1735 by John Rich, the manager of the Covent Garden Theatre, and Lord Peterborough, is the most famous of these clubs. It numbered among its members Garrick, Hogarth, Wilkes, John Kemble, and in 1785 the Prince of Wales joined the club. When the Covent Garden was burnt down in 1808, the club moved to the old Lyceum; afterwards it had rooms in the Bedford Coffee House, and finally in 1838 the 'Steaks' moved to the new Lyceum and there dissolved in 1867. *Consult Arnold's Life and Death of the Sublime Society of Steaks*, 1871. A B. Club was founded in 1749 by Thomas Sheridan (the actor and father of Richard Brinsley Sheridan), in connection with the Theatre Royal, Dublin, and Peg Woffington was elected president. The present B. Club in London was founded c. 1875 by A. J. Stuart-Wortley with rooms in Toole's Theatre. Its premises are now at 9 Irving Street, London.

Bee Steak Fungus, see FISTULINA.

Beehive Houses, primitive buildings made of unheven stones and without mortar, specimens of which are to be found in Ireland and W. Scotland. They consist of long stones laid down in a circle, each course being overlapped by the one resting immediately above it, so that with the

circular roof they resemble a bee-hive in shape. From the 7th to the 12th cent. churches, priests' houses, and other buildings were formed after this fashion.

Beekeeping is the keeping of honey bees (*Apis mellifica*) for honey and for the pollination of fruit, cereals, and flowers. Bees were formerly kept in straw skeps, but these have been superseded by 'National' (single-wall) and 'W.B.C.' (double-wall) wood hives; and there are now also observation hives of glass and transparent plastic materials, e.g. perspex. Vertical frames hanging side by side in the brood box hold the wax foundation, stamped with cell bases; the bees draw out horizontal, hexagonal cells from each side. Hives must be dry inside.

The bees draw out the combs, fill the cells with nectar, convert it to honey, and seal each with wax capping. Worker bees forage for nectar from blossoms from May to July and from heather on the moors from Aug. to Sept. Bees are kept in groups of hives in gardens (apiaries), or in fields, orchards, or on moors (out-apiaries). Colony yields of over 300 lb. of honey in a season have been recorded, but the average ann. yield is 60 to 80 lb. The amount of nectar collected in a wet, cold summer is negligible, and in such years the bees must be fed with sugar syrup or they will die. Surplus honey is removed, about 30 lb. being left for the bees' winter and spring food. The combs of honey in the cells are uncapped with a heated knife, and whirled round in an 'extractor'; centrifugal force throws the honey on the side of the cylinder. It runs to the bottom, where it is drawn off through a tap, and bottled through a strainer. The combs are then replaced in the hives for the bees to refill. The more viscous heather honey is extracted by squeezing the combs, and pressed wax is later processed into a fresh foundation. 'Sections' and 'chunk' honey (a divided comb, bottled and filled up with liquid honey) are eaten as produced.

Beekeepers subdue bees with smoke puffs, carbolic cloth, or chloroform. Head-nets and gloves are sometimes worn. Efforts are made to control swarming, as this reduces the honey yield. The normal stock in the hive numbers 40,000 to 50,000 bees. The swarm, of about 20,000 bees, with the queen, leaves the hive and clusters on a tree, bush, or similar place; unless the beekeeper can secure it by shaking it into a container and putting it in a hive the bees will depart to live in a colony as wild bees. See also BEE.

See E. B. Wedmore, *A Manual of Beekeeping* (revised 1945); W. Hamilton, *The Art of Beekeeping*, 1945; H. J. Wadely, *The Bee Craftsman*, 1945; A. L. Gregg, *The Philosophy and Practice of Beekeeping*, 1949; H.M.S.O., *Beekeeping*, 1951.

Beelzebub (god of flies, from Heb. *baal*, lord; *zebub*, fly), Philistine god, whose temple was at Ekron. It is also thought that the word developed from Baal-Zebul, i.e. lord of the high house. B. or Baalzebub appears in the N.T. as the prince of demons.

Beemster, polder in the prov. of N. Holland, Netherlands, reclaimed in the 17th cent. from the Zuider Zee. It is situated 13 m. N. of Amsterdam, and has a pop. of 6200.

Beer, Thomas (1889-1940), Amer. novelist and critic. b. Council Bluffs, Iowa. His forbears were lawyers for 5 generations back, and he himself practised for 4 years after studying at Yale and Columbia. In the First World War he served as a lieutenant in the Field Artillery, and after it turned to writing novels, among which are *The Fair Rewards*, 1922, *Sandoval*, 1924, and *The Road to Heaven*, 1928. *Mrs Egg and Other Barbarians*, 1933, is a collection of short stories. His critical works include a study of *Stephen Crane*, 1923, and *The Mauve Decade*, 1926, which was a name he coined for the 1890's. Although he wrote comparatively little, his reputation stands high.

Beer, see **BARLEY** and **BREWING**.

Beer Acts. The sale of beer in England is under magisterial control, though in the early part of the 19th cent. licences could be obtained without application to magistrates. In 1869 the Wine and Beerhouse Act was passed, regulating the sale of beer. By this Act a licence was estimated at a third of the ann. value of the beerhouse premises, and a minimum value was fixed, based on the pop. of the neighbourhood. For the first hundred barrels the brewers paid a tax of £1, and on every additional fifty 12s. Since those days beer has been subject to almost continuous taxation. The granting of licences, however, remains with the magistracy sitting in what are called Brewster Sessions. See **LICENCES** AND **LICENSING LAWS** for later legislation.

Beer-money was an allowance of one penny a day to soldiers of the Brit. Army in lieu of a supply of beer, instituted in 1800 and abolished 73 years later. It was also given to servants by householders instead of providing them with beer.

Beerbohm, Sir Max (1872-1956), writer and caricaturist. b. London, youngest son of Julius E. Beerbohm and Eliza Draper, and half-brother of Sir Herbert Beerbohm Tree. He was educ. at the Charterhouse and at Morton College, Oxford, and first became known as a writer through the *Yellow Book* quarterly, 1894-7. He was dramatic critic to the *Saturday Review* for 12 years from the retirement of Bernard Shaw in 1898. His book, *Around Theatres* (1924), contains articles contributed to that journal over a period of 12 years. His first pub. vol. of drawings, *Caricatures of Twenty-five Gentlemen*, appeared in 1896, the same year in which he issued a vol. of essays entitled *The Works of Max Beerbohm*. His later caricatures are in the vols. *The Poets' Corner* (in colour), 1904, *A Book of Caricatures*, 1907, *The Second Childhood of John Bull* (in colour), 1911, *Fifty Caricatures*, 1913, *A Survey*, 1921, *Rosselli and his Circle* (in colour), 1922, *Things New and Old*, 1923, and *Observations*, 1925. His other books are *The Happy Hypocrite*, 1897, *More*, 1899, *Zuleika Dobson*

(his one novel), 1911, *A Christmas Garland* (prose and verse parodies), 1912, *Seven Men*, 1919, *And Even Now*, 1920, *Yet Again*, 1923, and *The Dreadful Dragon of Hay Hill*, 1928. From 1910 until Italy entered the Second World War in 1940, he lived at Rapallo, from which retreat he surveyed the world with humour and detachment. He was knighted in 1939. From time to time successful exhibitions of his original drawings have been held in London. After his return to England during the war he gave 2 memorabl. broadcasts, and in 1943 he delivered the Rede Lecture, choosing Lytton Strachey's works as his subject. He returned to Rapallo in 1947. Both as a writer and as an artist he had a fastidious and carefully finished style, aiming at nothing short of perfection. Wit, elegance, humour, power of satire, and yet a human sympathy are his characteristics. See Bohun Lynch, *Max Beerbohm in Perspective*, 1921; and life by Lord David Cecil.

Beeroth, O.T. name for the modern Bira, a vil. in Palestine, 9 m. N. of Jerusalem.

Beers, Ethel Lynn (1827-79), Amer. poetess. b. Goshen, New York. Ethelinda Eliot was her maiden name and in 1846 she married W. H. Beers. Her poem on an unknown soldier, 'The Picket Guard,' with its famous first line, 'All quiet along the Potomac,' appeared in *Harper's Magazine* in 1861. In 1876 her *Collected Poems* were pub.

Beersheba (well of the oath, or possibly 7 wells), tn in the extreme S. of Palestine, 50 m. from Jerusalem. The expression 'from Dan to B.' shows its southerly position. The covenant of Abraham and Abimelech, King of the Philistines, was made there. Its Arabian name is Bir-es-Seba, meaning well of the lions. According to Eusebius, it was in his time a prosperous mkt tn and possessed a Rom. garrison. In early Christian times bishops of B. are occasionally mentioned, but by the 14th cent. the tn had lost all importance. The wells played a prominent part in the hist. of the patriarchs: B. being the scene of Hagar's trial and Ishmael's miraculous preservation; of Abraham's covenant with Abimelech, and of Jacob's setting forth on his journey to Haran (Gen. xxi, xxvi, xxviii). Two of the wells still hold water and 5 others have been discovered. It is now a small tn of about 6500 inhab. There is a Brit. military cemetery. During the First World War B. was captured from the Turks on 31 Oct. 1917 by Gen. Allenby's troops, and it was from B. that the advance was made which resulted in the capture of Gaza.

Beestings, see **COLOSTRUM**.

Beeston, urban dist. (constituted in 1935), with Stapleford, of Notts, England, 3 m. SW. of Nottingham. B. is mentioned in Domesday Book, and in the Middle Ages was an agric. community. Industries to-day include telephone works, manufacturing chemists, lace and hosiery manuf., pencils, upholstery, railway and boiler works, light engineering, foundries and iron works. The area comprises B.,

Stapleford, Chilwell, Bramcote, and Toton. Pop. (of B.) 22,551; of urban dist. 49,849.

Beeswax, substance produced by bees and used by them in the construction of the honeycomb. The wax is secreted by special glands in the abdomen of the bee, is pressed out between the segments of the body, and moulded into roughly circular cells for the reception of the eggs and honey. It may be collected by draining off the honey and heating the residue in water, when it rises to the surface and solidifies on cooling. B. is used for making candles, for modelling or casting ornaments or effigies, for polishing floors and furniture, and in medicine as a basis for ointments and plasters, on account of its non-irritant quality. It is sometimes taken internally, when it acts as a protective to the gastric and intestinal surfaces.

Beeswing, very light sediment, mainly mucilaginous, which floats in vintage port, not settling as a crust on the bottle. Its presence in the decanter is welcomed as a sign of age.

Beet, name applied to sev. species of *Beta* of the family Chenopodiaceae. The roots of many species are valued as a food, and *Beta vulgaris*, the common B., is used in the manuf. of sugar. *B. maritima*, sea or wild B., is eaten as a vegetable as well as *B. rubra*, the red beetroot. *B. cicla*, white beetroot, is cultivated for its leaves, which are eaten like spinach. From *B. vulgaris* is derived the sugar B., and also the mangel-wurzel. The production of B. sugar on a large scale has been promoted for some years in the U.S.A., and in Germany and other European countries, while efforts have been made to stimulate its production in Great Britain, at some expense, it is true, to cane sugar production in the Brit. W. Indies. A gov. subsidy was granted after the First World War and has been reviewed recently. At present growers are protected against violent fluctuations in price by the operation of a guaranteed minimum price scheme which is revised annually. Half the world's supply of sugar is now derived from the beetroot. The estimated average ann. world production (all countries) of sugar B., 1953-4, was 100,000,000 tons.

Beet-fly (*Anthomyia betae*), insect, so called because the maggots feed on beet leaves. As soon as the maggots are hatched they begin to feed on the leaf round them and continue feeding for one month, when they turn to chestnut-brown pupae. The flies come out a fortnight later and are grey in colour with black hairs.

Beethoven, Ludwig van (1770-1827). Ger. musical composer, was of Flem. descent. His grandfather, Louis, left Antwerp in 1732 and settled in Bonn, where he became one of the archbishop-electors' musicians. His son (father of Ludwig) was a tenor singer at the court, but through drink and thriftlessness was always poor. The grandfather d. when Ludwig was only 4 years old, but the latter, to whom he had been kind, always cherished his memory. Ludwig's father

taught him to play the violin and clavier; he displayed such precocity that at 9 he had to be placed under more accomplished teaching. At 12 years of age he occasionally acted as deputy for the court organist, and at 13 pub. his first composition. In 1784 he was appointed assistant organist to the court, and played the viola in the orchestra at the opera. Three years later, during a short visit to Vienna, he played before Mozart, who was amazed at his talent in improvisation. For the next few years his life at Bonn was a trying round of hard work and responsibility; his mother d., and his father's habits became so disorderly that his salary had to be paid to Ludwig, who



BUST OF BEETHOVEN BY C. SEFFNER IN THE GEWANDHAUS, LEIPZIG

thus, at about 19, became head of the family. In 1792 the archbishop-elect (brother of the Emperor Joseph II) sent him to Vienna to study under Haydn (q.v.), whom he had already met twice at Bonn. But Haydn was little interested in teaching, while B. was impatient of it, so that little came of the connection. But B. worked his way by genius and by further study under Albrechtsberger (counterpoint), Aloys Förster (quartet writing), and Salieri (vocal setting), and in a few years was a 'personage' in the musical world of Vienna, in spite of an ungovernable temper and rude manners. For example, at the house of Count Browne, he was playing a duet when a young nobleman in the room persisted in talking to a lady. B. stopped suddenly, saying loudly: 'I play no longer for such hogs.' Of a suspicious nature, he was insulting to those he suspected, even people of high rank. Haydn nicknamed him 'The Great Mogul.' Yet the aristocracy bore with it all for the sake of his genius. Princesses and countesses would forgive any rudeness, would receive his lessons whenever he pleased, and put up with his storming and tearing up their

music if they were careless. He had no tact or discretion in matters of ordinary life. He was peculiar in appearance: 5 ft 5 in. in height, broad-shouldered, large-headed, and ruddy in complexion. As a teacher he was impatient but pains-taking; in piano playing he was quiet, but extravagant in conducting. He was so absent-minded that he once insisted on paying a waiter for a dinner he had not had or even ordered. It must be said in excuse for his peculiarities that his early troubles had affected his health and spirits. When he *d.* a post-mortem examination proved that he had suffered since childhood from an incurable disease aggravated by want of home comfort and good food, and later by unskilful medical treatment. His liver had shrunk to half its proper size, and there were serious ailments of old standing in the ears and pharynx. His family, too, tried him greatly; his father's character has already been mentioned, and his brothers, Johann and Caspar, the latter in particular, caused him endless trouble, and when the latter *d.* his son turned out an even worse trouble to his uncle and guardian, whose self-denying endeavours on his behalf were unfortunately made very trying to the thoughtless boy, by moral preaching alternating with an oppressive affection. In a pathetic document written by B. as far back as 1802 he complains of the harsh judgments passed upon him by those who knew nothing of the years of suffering he had endured, and tells of the dread which he felt of his growing deafness, which would incapacitate him for the enjoyment both of society and of his beloved art. This deafness in time became so complete that although he still played and conducted he heard nothing of the music. His finest works were composed after he had lost the power of enjoying them. His life ended sadly. In the winter of 1826-7 he was staying at the house of his brother Johann, and was taken ill. His brother would neither let him have a fire in his room nor give him the food he required, and at length sent him back to Vienna, during bad weather, in an open chaise; he took a severe chill, which brought on dropsy, and he *d.* on 26 Mar. As a musician B. stands alone. In his earlier work the influence of previous masters, especially Haydn, may be traced, but gradually he built up a style of his own, more and more noble as years went on. His total production is broadly divisible into three periods. In the first although influenced by his predecessors he already began to show such individuality that, for example, Haydn advised him not to publish his Trio in C minor (Op. 1, No. 3), probably as being too daring for public taste. To this first period belong his Sonata for pianoforte in E flat (Op. 7); Trio for pianoforte and strings in B flat (Op. 11); *Sonate Pathétique*; First Concerto for pianoforte and orchestra in C (Op. 15); the song *Adelaide* (1797); also the famous Septet (Op. 20) and the first Symphony (Op. 21) (the last 2 works pub. in 1800). His second period, which included his *Sinfonia*

Eroica, *Fidelio* (including the *Leonora* overtures), the overtures to *Prometheus*, *Coriolanus*, and *King Stephen*, the *Egmont* music, and the *Appassionata*, with other sonatas, merged imperceptibly into that of his latter years (about 1816 onwards), which in originality of conception and construction transcended anything previously achieved. To this period belong the enormous pianoforte Sonata in B flat (Op. 106), the 9th (choral) Symphony, the *Missa Solemnis*, the marvellous Quartets for strings (Opp. 127, 130, 132, 135), the 33 Variations on a waltz by Diabelli (Op. 120), and the Mass in D. The influence of B. on the form and growth of musical art has been immeasurable. The B. literature is enormous, especially in German and English. It includes A. W. Thayer, *The Life of Ludwig van Beethoven* (3 vols.), New York and London, 1921; A. Leitzman, *Ludwig van Beethoven* (companions, letters, and personal characteristics) (2 vols.), Leipzig, 1921; W. Nohl, *Ludwig van Beethoven als Mensch und Musiker in täglichen Leben*, Stuttgart, 1922; M. Grusemann, *Beethoven*, Munich, 1923; A. Albertini, *Beethoven*, 1924; P. Bekker, *Beethoven*, 1925; L. Schiødermayer, *Der junge Beethoven*, Leipzig, 1925; W. J. Turner, *Beethoven*, 1927; E. Newman, *The Unconscious Beethoven*, 1927; A. Hévesy, *Beethoven the Man*, 1927; R. Specht, *Beethoven as he lived* (trans.), 1933; W. J. Turner, *Beethoven: the Search for Reality*, 1933; Marion M. Scott, *Beethoven* (Master Musicians series), 1931; E. Closson, *The Fleming in Beethoven* (trans.), 1936; Édouard Herriot, *The Life and Times of Beethoven* (trans.), New York, 1936; Walter Riezler, *Beethoven* (trans.), 1938; L. Schrade, *Beethoven in France*, 1942; E. Ludwig, *Beethoven: Life of a Conqueror* (trans.), 1945. See also G. Grove, *Beethoven and his Nine Symphonies*, 1903; T. Helm, *Beethovens Streichquartette*, Leipzig, 1921; C. E. Lowe, *Beethoven's Pianoforte Sonatas* (hints on rendering and form), 1921; E. Evans, *Beethoven's Nine Symphonies* described and analysed (2 vols.), 1923; Eric Blom, *Beethoven's Pianoforte Sonatas discussed*, 1938; D. F. Tovey, *Beethoven* (musical exercises), 1944.

Beetle, common name for an order of insects, the scientific name of which is *Coloptera* (q.v.), possessing hard and horny fore-wings. The word B. is also loosely applied to cockroaches (q.v.) of the *Blattidae* family of orthopterous insects.

Beetle, Colorado, see COLORADO.

Beetling, process designed for the finishing of linen and cotton goods in which a beetling machine hammers down the cloth by means of wooden stamps which rise in succession and fall by their own weight. This flattens the surface of the cloth and gives it a hard appearance.

Beeton, Isabella Mary (1836-65), writer on cookery, b. London. Her maiden name was Mayson, and she was educ. at Heidelberg. In 1856 she married Samuel Orchard Beeton, a leading publisher. In 1861 appeared her *Book of Household Management*, a colossal manual of cookery

and household economy which had taken 4 years to prepare and which at once became an accepted classic. Mrs Beeton was still in her twenties when she *d.* of puerperal fever. See H. Montgomery Hyde, *Mr and Mrs Beeton*, 1951.

Beets, Nicolaas (1814-1903). Dutch poet and author, *b.* Haarlem. He was a parson, and prof. of theology at the univ. of Utrecht, 1875-84. He is remembered chiefly for his stories of Dutch life. His *Camera Obscura* (1st ed. 1839, under the pseudonym Hildebrand) has been trans. into many European languages. The continuation, *Na Vijftig Jaar*, appeared in 1887. He also wrote critical and theological essays, of which *Stichtelijke Uren* may be mentioned. His poetry was pub. in 4 vols. (1873-81). See J. J. Duproix, *N. Beets et la littérature hollandaise*, 1907, and G. Tazelaar, *De cultuurwaarde van Hildebrands Camera Obscura*, 1939.

B.E.F., see BRITISH EXPEDITIONARY FORCE.

Befana (corruption of Epiphany), name of a legendary old woman who, being busy sweeping her house when the 3 wise men of the E. passed on their way to offer gifts to the Infant Christ, excused herself from going to the window on the ground that she would see them on their return. The wise men returned another way, and B. was punished by being obliged to wait for them ever since. Her festival is held in Italy on 5 Jan., when her effigy is carried through the streets amid great rejoicing. On Twelfth Night It. children hang up a stocking before the fire, and B. brings presents to good children, but to bad children ashes. The tradition appears to be confused, for although she is the counterpart of Santa Claus, her name is used, like that of a bogey, to frighten naughty children.

Beffroi, Belfry, or Breaching Tower, movable tower used in medieval times during military sieges. It moved on wheels, was sev. storeys high, and was usually covered with raw hides to protect the besiegers in the lower storey from boiling oil and fire. An upper storey held a hinged drawbridge to be let down upon the city wall for the landing of the assailants. Such a tower is mentioned by Froissart. See also BELLERY.

Beg (Turkish; Ottoman Turkish *Bey*). title. It has 3 meanings: noble as opposed to commoner; ruler of a small tribe or state as opposed to *khan* (q.v.); a gov. official. In Turkey it was given to the higher officers in the army, the sons of pashas, and, popularly, to rich and influential persons. The ruler of Tunis was called *bey*.

Begarelli, Antonio (c. 1479-1565), It. modeller in terra-cotta, *b.* Modena. He was the friend of Correggio. There are few of the works of B. left; the prin. are the 'Descent from the Cross,' and a 'Pietà' at Modena, containing many figures in the round rather larger than life.

Begas, Karl (1794-1854), Ger. painter, *b.* Heinsberg; was court painter to the King of Prussia and prof. in the Academy of Arts, Berlin.

Begas, Reinhold (1831-1911), Ger. sculptor, son of Karl B., *b.* Berlin and studied there and in Rome. In 1866 he returned to Berlin, where he spent the rest of his life. He executed statues and architectural designs for public places, as well as numerous portrait busts. Among his best-known works are statues of Schiller, 1863; Humboldt, 1882; Bismarck, 1901; the sarcophagus of Frederick III in the mausoleum of the Friedenskirche at Potsdam; the statue of Borussia for the Hall of Glory and the national monument to the Emperor William, both in Berlin; and the Neptune bronze fountain in the Schlossplatz, Berlin.



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BEFFROI OR BREACHING TOWER

Begg, Alexander (1840-97), Canadian writer, *b.* Quebec. He took part in the NW. rebellion against Htel. Author of *The History of the North-West*, 1894, *The History of British Columbia*, 1895, and, in collaboration with W. R. Nursey, *Ten Years in Winnipeg: a Narration of the Principal Events in the History of the City from 1870 to 1879 inclusive*, 1879.

Begg, James (1808-83), Free Church leader, *b.* New Monkland, Lanarkshire; educ. at Glasgow Univ. He was strongly opposed to anything savouring of liberalism in theology and church practice—particularly the projected union with the

United Presbyterian Church. See life by T. Smith (1885-8).

Beggar, word of uncertain origin, used in speaking of a person who asks alms, usually habitually, and who generally lives on the money and goods which he thus receives. See MENDICANCY; POOR LAWS; VAGRANTS.

Beggar-my-Neighbour, game of cards, played by 2 or more persons. The players, holding their cards with backs upward, play down a card alternately, until one player turns up a court card, when his neighbour must pay him 4 cards for an ace, 3 for a king, 2 for a queen, and 1 for a knave, and in addition he wins the cards already thrown on the table and places them all under those in his hand. At last one player obtains all the cards in the pack and wins the game.

Beggars, The, see GUEUX, LES.

Beghards, association of men formed during the early part of the 13th cent. in the Low Countries, corresponding to and probably in imitation of the female *Béguines* (q.v.). Many vagabonds and mendicants adopted the title who did not belong to the brotherhood. They were denounced by the Pope and councils, and suffered persecution from the Inquisition. Their communities had almost disappeared by the end of the 14th cent., but survived till the Fr. Revolution.

Begharmil, see BAGIRMI.

Bégin, Louis Nazaire, Cardinal (1840-1925), Canadian archbishop, b. Point Lévis, 10 Jan. He was educ. at the Little Seminary, Quebec, and at the Laval Univ., where he was awarded the Prince of Wales's gold medal in 1862, being the first to receive this prize. He was ordained in 1865 at Rome, where he remained to make a special study of eccles. hist. and oriental languages, 1866-7. He was prin. of the Laval Normal School, Quebec, 1885-8; Bishop of Chicoutimi, 1888-91; coadjutor to Cardinal Taschereau, with the title Archbishop of Cyrene, 1891-8; and Archbishop of Quebec from 1898. He was made cardinal in 1914. B. wrote *La Primauté et l'infaillibilité des souverains pontifes*, 1873; *Le Culte catholique*, 1873; *La Sainte Eglise et la règle de foi*, 1874; *Aide-mémoire ou chronologie de l'histoire du Canada*, 1886; *Catechisme de controverse*, 1902.

Begierbeg, or **Beyleybeg**, Turkish word which signifies bey of beys; applied in the Turkish Empire to the Governor-General of a prov. who had under him sev. beys and was second in rank to the grand vizier.

Bégles, Fr. tn in the dept of Hérault. It has paper manufs., and a trade in wine and market-garden produce. Pop. 22,300.

Begonia, genus of succulent herbs, native to moist tropical countries, about 350 species, family Begoniaceae; widely grown in gardens.

Begoniaceae, family of tropical dicotyledonous plants, comprising 4 genera, *Haplophragma*, *Hillebrandia*, *Symbegonia*, and *Begonia*, the chief. All *Begonia* have fleshy leaves, often richly coloured with crimson, succulent stems, and pink

flowers growing in panicles; the leaves are root-leaves, and have one side larger than the other—hence the name of elephant's ear sometimes given to the plant.

Béguines, order of sisters belonging to the Rom. Catholic Church, traditionally founded by St Begga in 698, but, as now accepted, by a priest, Le Bégué, in the 12th cent. They were first known in Holland and Germany. They took no vows, and they lived in close proximity, in separate houses called *béguinages*. Their houses often received large donations, which were devoted to charitable purposes. A hospital adjoined each institution, and frequently a church also. The sisters lived in purity and poverty, giving their services in nursing, and tending the aged as well as educating the children. The sisterhood is still in existence in the Rom. Catholic Church. The most famous of the institutions is at Ghent, under the name of St Elizabeth's *Béguinage*.

Begum (origin uncertain; Persian and Urdu *begam*), Muslim queen or lady of high rank.

Behaim, Behem, or Boenheim, Martin (c. 1459-1506), Ger. cosmographer, b. Nuremberg. He studied under Regiomontanus (Johann Müller). In 1484 he accompanied the fleet of the Portuguese Diogo Cão on a journey of discovery along the Congo coast, W. Africa. He acquired fame for his methods of finding the lat. at sea, for his maps, and for the globe which he bequeathed to his native city, but it is now recognised that serious errors occurred in these and it is believed that his reputation has been greatly exaggerated. See E. G. Ravenstein, *Behaim: his Life and his Globe*, 1909.

Behar, see BIHAR.

Behaviourism, name given to the teaching in a primarily Amer. school of psychology which originated in the early years of the 20th cent. The name arose from the study of the behaviour of animals, but it was not till the results of these studies had been applied to human psychology that the teaching was so designated. The best-known exponent of B. is Dr J. B. Watson, and it was his 2 monographs, *Psychology as the Behaviourist Views it* and *Image and Affection in Behaviour*, both pub. in 1913, and his book, *Behaviourism: an Introduction to Comparative Psychology* (1914), that first crystallised the doctrines of B. It was Watson who first applied to man the characteristic principle of B. that all that could properly be studied was observable behaviour and that no concepts could be used that were not based on observations of behaviour or of structure. This principle excluded the study of experience and the use of concepts (such as imagery) that were derived from one's own experience and that could not be observed by an outside observer. It is obvious that, in the study of animal psychology, the experimenter is limited to the observation of behaviour. The implications of this limitation were recognised earlier by the Brit. psychologist C. Lloyd Morgan, whose *Animal*

Behaviour (1900) embodied a study of animal behaviour without the speculations about what passed through the animal's mind which had been a feature of much earlier animal psychology. This tradition was carried on by Thorndike in America and by Köhler in Germany in their work on the intelligence of chimpanzees and, in our own time, it is the characteristic method of the Ethologists led by Lorenz.

The essential contribution of Watson was the suggestion that human psychology should accept the same limitations. As an instrument for the study of human beings without asking for subjective reports, he suggested the use of the 'conditioned reflex' or acquired automatic response discovered by the Russian Pavlov. This radical reorientation of human psychology met with considerable opposition from those who regarded the subjective as an essential part of the study of psychology. The extreme position of J. B. Watson has now generally been abandoned, and a more moderate version of the programme is put forward by such writers as Tolman under the name of 'neo-behaviourism.' At the same time all modern psychology has discarded much of the subjectivism or mentalism that was attacked by Watson. See J. B. Watson, *Behaviourism*, 1925; Bertrand Russell, *Analysis of Mind*, 1927; E. C. Tolman, *Purposive Behaviour in Animals and Men*, 1932.

Behbahan, dist. and tn in the prov. of Khuzestan, Persia. Ruins of Arrajan are in the vicinity. Pop. of tn 24,000.

Behading, see DECAPITATION.

Behem, Martin, see BEHAIM.

Behemoth (Heb., 'large beast'), is a large herbivorous animal mentioned in Job xl. 15-34. It is supposed by many interpreters to mean the hippopotamus. Cf. Herodotus, ii. 70 f.

Behera, or **Beheira**, prov. of Egypt, forming part of the delta of the Nile, W. of the Rosetta branch of the Riv. The chief tn of the dist. is Damauhur (q.v.). Pop. 1,244,495 (1947).

Behistun, or **Bisitun**, rocky mt side in Ardalan, Persia, 22 m. E. of Kermanshah. It rises to a height of 1700 ft, and bears an inscription, at a height of 300 ft, in cuneiform writing in 3 languages, Persian, Sasanian or Elamitic, and Babylonian, besides some minor records in Arabic and Greek. The main inscription, first read and copied by Sir Henry Rawlinson (1837-1845, q.v.), relates the exploits of Darius the Great (d. 485 BC), and led to the decipherment of the Akkadian (Assyrian-Babylonian) script.

Behmen, Jakob, see BOEHME, JAKOB.

Behn, Aphra (1640-89), novelist and dramatist, b. Wye in Kent, daughter of a barber named Johnson. She was taken as a child to S. America and brought up at Surinam, where she became acquainted with the celebrated slave Oroonoko, hero of one of her novels. She married a Dutch merchant, B., on returning to England, and later was employed on a diplomatic service in Flanders by the king. When left a widow she supported

herself by her pen. Her works suffer from coarseness, but show considerable ability. Her best drama is *The Rover*, 1677, and her most famous novel *Oroonoko*, 1688. Her works (6 vols.) appeared in 1871; also ed. by M. Summers in 1915. See V. Sackville West, *Aphra Behn*, 1927, and G. Woodcock, *The Incomparable Aphra*, 1948.

Behrens, Peter (1868-1940), Ger. architect, b. Ilamburg. He became a pioneer of the 'Modern Movement' in architecture. After working in Munich, Darmstadt, and Düsseldorf he moved c. 1907 to Berlin and in 1922 to Vienna. He was prof. of architecture at Vienna, 1922-7. He designed many important industrial and commercial buildings in Germany. Among his pupils were Gropius (q.v.), 'Le Corbusier' (q.v.), and Van der Rohe (q.v.).

Behring, Emil von (1854-1917), Ger. bacteriologist, b. Hausdorf, Prussia. Graduated in medicine at Berlin, 1878, and served as an army surgeon for 7 years. With S. Kitasato he discovered antitoxins (q.v.) and estab. the possibility of securing immunity from tetanus by the use of a serum developed from an infected animal. Similarly he developed a diphtheria antitoxin from a culture of diphtheria bacillus, making immunisation possible. He was the first recipient of the Nobel prize for medicine (1900). His works include (titles translated): *Theory of Serotherapy*, 1892; *History of Diphtheria*, 1893; *Aetiology of Tetanus*, 1901. See life by H. Zeiss and R. Bieling, 1910.

Behring, Vitus, see BERING.

Behring Island, **Behring Sea** and **Strait**, **Behring Sea Question**, see BERING.

Beibars, **Baybars**, or **Bibars**, 2 Egyptian rulers: (1) Beibars I (1269-77), sultan of the Mamelukes. He fought against the Christians and the Mongols. He defeated the crusaders under Louis IX of France, captured Antioch in 1268, and ravaged the country round Mecca in 1269. In that year he murdered his master, the Egyptian sultan Kotuz, and became sultan in his place. He subdued the Armenians, and at one time almost extirpated the Syrian Assassins. The mosque at Cairo which bears his name was erected by him. (2) Beibars (Jashengir) II (1309-10) was a Circassian by birth. He was made ruler of Egypt by the Bahri Mamelukes, but was assassinated by a rival within a year.

Beijerland, or **Bayerland**, name of 3 Dutch vils. known as Oud, Nieuw, and Zuid B., situated on the is. of Hoeksche-ward, prov. of S. Holland. Total pop. 11,500.

Beilby, Sir George (1854-1924), Scottish scientist. Educ. privately and at Edinburgh Univ. His researches in low-temperature carbonisation of coal were of service to the nation. During the First World War, when the conservation of oil for the navy became an anxious problem, the distillation of bituminous coal at low temperatures provided a way of obtaining fuel oil from home sources. The Fuel Research Board, of which B. became chairman, was set up in 1917. B.

then set up the Fuel Research station at Greenwich for inquiring into the systematic survey and classification of Brit. coals and the treatment of coal by carbonisation and gasification so as to make the best use of its by-products. Another service B. rendered to the country was the institution of the therm system of charging for a tn's gas, whereby the consumer pays not for vol. irrespective of quality but for calorific power. He pub. a number of papers on the physical properties of solids and summarised these in *Aggregation and Flow of Solids*, 1921, which book won him the fellowship of the Royal Society.

Beilstein, Friedrich Konrad (1838-1907). Russian chemist, b. St. Petersburg in 1838. In 1866 he was made prof. of chemistry at the St. Petersburg Technological Institute, from which position he retired in 1896. His pub. are numerous.

Beira, chief tn of the B. dist., Portuguese E. Africa, a seaport at the mouth of the It. Pungwe. It is connected by a line 200 m. in length with the Rhodesian railway system, and is the outlet for the copper of Katanga (Belgian Congo) and of Rhodesia. Transit traffic through the port to and from the Federation of Rhodesia and Nyasaland was assessed at 2,906,918 tons (1954) and will increase with the continual harbour extensions. Pop. 30,544 natives, of whom 6626 are Europeans.

Beira Alta, prov. of central Portugal, containing most of the dists. of Viseu and Guarda, and a small part of the dist. of Coimbra (qq.v.). It is bordered on the E. by Spain, and is generally mountainous. The prin. tn is Viseu (q.v.). Area 3682 sq. m. Pop. 691,700.

Beira Baixa, prov. of central Portugal, containing the dist. of Castelo Branco, and parts of the dists. of Coimbra and Santarém (qq.v.). It is bordered on the E. and SE. by Spain, and on the SW. by the Tagus (q.v.). It is mountainous, but has many fertile riv. valleys. The prin. tn is Castelo Branco (q.v.). Area 2896 sq. m.; pop. 355,800.

Beira Litoral, prov. of W. Portugal, containing most of the dists. of Aveiro and Coimbra, and smaller parts of the dists. of Leiria and Santarém (qq.v.). It has a long coastline on the Atlantic, and is generally low-lying and fertile, but is hilly in the E. It is watered by the Vouga and the Mondego. The prin. tn is Coimbra (q.v.). Area 2930 sq. m.; pop. 969,200.

Beiram, see BAIRAM.

Beirut, cap. and prin. seaport of Lebanon, 55 m. WNW. of Damascus on a bay of the Mediterranean. Pop. 400,000. The walls are 3 m. in circumference, and the suburbs beyond the walls are greater than the enclosed tn. B. is a progressive commercial centre, with good communications by road and rail, sea, and air. Large ships generally anchor in the harbour and unload by lighter. B. is clean, plentifully supplied with springs, and contains large bazaars, an Amer. Protestant Univ. and a Fr.

Jesuit college, the palaces of a Gk and a Maronite bishop, and many missions and other institutions. The prin. exports are silk goods and wool, oils, oranges, and other fruits. B. was bombarded in Feb. 1912, during the Italo-Turkish war. In the First World War it was occupied by Gen. Allenby's victorious army on 8 Oct. 1918. In the Second World War B. was bombed by Brit. planes on 4 June 1941, during the short period of hostilities between the allied forces and the Fr. troops in Syria under the orders of the Vichy Gov. Since the estab. of B. as the



The Matson Photo Service, American Colony, Jerusalem

cap. of the independent rep. of Lebanon (q.v.), the tn has greatly increased in pop. and prosperity.

Beisan (Bethshan in the O.T., Scythopolis in the N.T. and Bessan in the crusades), tn in Israel, at SE. end of plain of Esdraelon. During the First World War B. was captured from Turks by Gen. Allenby, 20 Sept. 1918. Was scene of Arab disturbances in April 1920, and again in Aug.-Sept. 1929 during the Zionist-Arab trouble over the Wailing Wall (q.v.). Excavations begun in 1921 by the Museum of Pennsylvania Univ. have produced a complete list. of the site from about the 16th cent. bc. The earliest city level reached was that of Thothmes III, but older levels have been cleared. Among the relics unearthed were a Canaanite temple, dedicated to 'Mekal, the lord of Beth-shan,' and a basalt tablet showing a lion and a dog representing respectively Nergal, the god of death, and the guardian of the temple.

Other temples found point to B. as a centre of serpent cult in some form and suggest that the anct name, Bethshan, was derived from Shakhān, the name of an early Mesopotamian serpent deity. Other finds of archaeological value, as representing types unknown elsewhere in Palestine, include a large Graeco-Rom. temple, various stelae of Canaanite and Egyptian kings, and a circular Byzantine church. Some of these finds are now lodged in the Jerusalem museum.

Beit, Alfred (1853-1906), S. African financier and philanthropist, b. Hamburg. He was a close friend of Cecil Rhodes, and assisted him in the amalgamation of the Kimberley mines into the De Beer's Consolidated Mines. After 1888 he was engaged in developing the Transvaal gold-mines, and in 1889 became a director of the Brit. S. Africa Co. for the administration of Rhodesia. In 1905 he founded professorships at Oxford in colonial hist., and left large sums to various charities.

Beit, Sir Otto (1865-1930), S. African financier and philanthropist, brother of Alfred B., b. Altona, Germany. In 1898 he settled in England as a stockbroker. He was much interested in the problem of developing S. Africa by land settlement schemes, and in order to remain in close touch with that country he accepted a post as director of the Brit. S. Africa Co. He contributed large sums for public purposes, including the provision of sanatoria, libraries, and an institution for homoeopathic research. In memory of his brother he founded the B. memorial fellowships for medical research. He was made F.R.S. and knighted in 1920 and created baronet 1924.

Beit (Heb. *beth*), Arabic word which properly signifies a tent or hut, but is also used to denote any edifice or abode of men. It is often found as a component part of proper names, e.g. Beit-al-harām, i.e. the sacred edifice, or the edifice of the sanctuary, a designation frequently given to the temple of Mecca.

Beit Guvrin (Rom. Eleutheropolis and the Beth Gibein of crusading times), vil. of Israel, W. of Hebron. It is of archaeological interest. The churches of Sandahanna in the vicinity furnish examples of Rom. technique applied to Christian buildings. In 1921 a fine Rom. mosaic of the 3rd cent. AD was excavated. The Israelitish tn of Mareshah (Gk Marissa) near by has also recently been excavated. Among the most striking finds are painted tombs of the Heb. period, wall paintings, rock caverns, etc. A 2nd-cent. tomb, that of Apollophanes, with gabled roofs, is said to be the only one of its kind found in Palestine. Consult Luke, *Handbook of Palestine*, 1930.

Beith, John Hay, pseudonym Ian Hay (1876-1952), novelist, ednc. at Fettes and St John's College, Cambridge. In the First World War he served as a captain in the Argyll and Sutherland Highlanders, was awarded the M.C. and made a C.B.E. He wrote a number of stirring war books, *The First Hundred Thousand*, 1915, being followed by *Carrying on*, 1917. His light and humorous novels, which

were very popular, include *Pip*, 1907, *The Right Stuff*, 1908, *A Man's Man*, 1909, *A Safety Match*, 1911, *A Knight on Wheels*, 1914, and *The Willing Horse*, 1921. His plays *Tilly of Bloomsbury*, 1919, and *The Housemaster*, 1936, are light comedies, while *The Lighter Side of School Life*, 1914, is a series of amusing pen-pictures. During the Second World War B. was Director of Public Relations at the War Office.

Beith, tn of N. Ayrshire, Scotland, 11 m. SW. of Paisley, with cabinet-making and upholstery industries. Pop. 6900.

Beja: 1. Dist. of S. Portugal, in Baixo Alentejo prov. (q.v.). It is bordered on the W. by the Atlantic and on the E. by Spain, and is watered by the Guadiana (q.v.) and the Sado. It has extensive cork-oak forests. Area 3968 sq. m.; pop. 286,800.

2. (Anct Pax Julia), tn of Portugal, cap. of B. dist. and of Baixo Alentejo prov. (q.v.). It has Rom. remains, a cathedral, and a 14th-cent. castle. Textiles and pottery are manuf., and there is a trade in agric. produce, wine, and olive-oil. Pop. 13,000.

Beja, or **Boja** (Bisharin), African people N. of Ethiopia, between the Nile and the Red Sea, widely spread in Nubia. They are probably Hamitic, and include the Ababda, Hadendoo, Bisharin, and other tribes. They are Muslims. They represent the Blemmyes of Strabo.

Bejan, or **Bajan** (medieval Lat. *bejanus*; Fr. *bec jaune*, yellow beak, i.e. fledgling), name applied to freshmen in the univs. of the Middle Ages, still surviving in St Andrews and Aberdeen. Benjamin, or payment for students entering the univ., was part of an opening ceremony which led to horse-play and rowdiness.

Béjar, Sp. tn in the prov. of Salamanca, on a high ridge (3068 ft) above the R. Cuerpo de Hombre. It has a 16th-cent. palace belonging to the dukes of B., and a 13th-cent. church. B. is an important textile centre. Pop. 14,000.

Bek, Antony (d. 1310), Eng. bishop, created Bishop of Durham in 1283 by Edward I. He was renowned for his magnificent retinue. He was one of the royal commissioners to negotiate a marriage between the king's son, Edward, and Margaret, infant Queen of Scotland, 1290. In 1296 he took part in Edward I's expedition against Scotland, and received Balliol's submission in the castle of Brechin. After his return from the battle of Falkirk he appears to have lost Edward's favour. In 1302 B. set out to Rome to lodge an appeal against Richard de Hoton, prior of Durham, without asking the king's leave; in consequence the temporalities of his see were confiscated, but he afterwards regained them. Clement V made him patriarch of Jerusalem in 1305, and 2 years later Edward II granted him the sovereignty of the Isle of Man.

Bek, Thomas (d. 1293), Eng. bishop, brother of Antony B. (q.v.). In 1269 he became Chancellor of Oxford Univ.; keeper of the wardrobe to Edward I. 1274; keeper of the great seal during Edward's absence in France, 1279; Bishop

of St Davids, 1280. He protested unsuccessfully against Archbishop Peckham's visitation of his diocese in 1284.

Beka'a, El, or Elbika, see COELE-SYRIA.

Beke, Charles Tilstone (1800-74), explorer, b. Stepney. He joined an expedition to Ethiopia in 1840, and pub. the result of his travels in *Abyssinia: a Statement of Facts* (2nd ed.), 1846, and *On the Sources of the Nile*, 1849. In 1864 he visited Harar, and 4 years later he set out for Ethiopia to urge the release of certain Brit. captives, but was unsuccessful.

Békés, in of Hungary, in B. co., on the White Körös (q.v.), 8 m. NNE. of Békéscsaba (q.v.). It is the mkt tn for a dist. of the Alföld (q.v.), and has textile, furniture, and brick manufs. Pop. 29,500.

Békés County, see BÉKÉSCSABA.

Békéscsaba, in of SE Hungary, cap. of Békés co., near the Körös (q.v.), 110 m. SE. of Budapest (q.v.). A previous tn on the site was destroyed by the Turks in the 16th cent. The first inhab. of the present tn were Slovaks (q.v.), and the Lutheran cathedral of B. is the largest Slovak church in Hungary. B. is the centre of an agric. dist. of the Alföld, and has textile and poultry-processing industries. There is an airfield. Pop. 48,000.

Bekker, August Immanuel (1785-1871), Ger. classical scholar and philologist, b. Berlin, where he held the chair of philology, 1811-71. He revised the texts of many of the classics from the MSS. in the large libraries of Europe, independently of other printed eds. He also ed. 25 vols. of the *Corpus Scriptorum Historiae Byzantinae*, and *Anecdota Graeca* (3 vols.), 1814-21.

Bekker, Balthazar (1634-98), Dutch Protestant theologian, b. Friesland; educ. Groningen and Franeker; pastor at Franeker, and after 1679 at Amsterdam. His *De Philosophia cartesiana admodum sincera*, 1665, worked out a relationship between Descartes' philosophy and theology. His most famous work, *Die Belooferde Wereld, or The World Bewitched*, 1691, an early critical study of comparative theology, expresses a disbelief in sorcery, magic, and even the existence of the devil. On its pub. B. was removed from the ministry.

Bekker, Elisabeth (1738-1804), Dutch poetess and novelist, the wife of Adrian Wolff. She resided in France for some time with Agatha Dekon, and it was in conjunction with this friend that she wrote her novels, sentimental works in the style of Richardson. Perhaps her most popular works were *Historie van den Heer Willem Leerd*, 1785, *Historie van Mejuffrouw Sara Burgerhuut*, 1782, *Abraham Blankaart*, 1787, and *Cornelie Widschud*, 1793-6.

Bektashi, name applied to a class of dervishes (q.v.) estab. in 1357 by Hadji Bektash, the venerable Islamic saint. When called upon by Amurath I to bless his soldiers, he gave them the name of *yenishery* (Turkish 'new soldiers'). From

this term was derived the form janizary (see JANTZAHIES).

Bel, or Belus, deity of the Babylonians and Assyrians, known to the Hebrews as Baal, the name signifying 'lord' in both languages. B. was later identified with Marduk (q.v.) and corresponds to the Gk Zeus and the Rom. Jupiter.

Bel, Joseph Achille Le, see LE BEL.

Bel and the Dragon, The Story of, one of the deutero-canonical additions to the book of Daniel in the Bible, of which the original text, if Hebrew or Aramaic, has been lost. It forms part of the Rom. Catholic Bible and of the Anglican apocrypha. The tale is generally accepted as an edifying romance written to impress the futility of idol worship. It runs as follows:

Daniel declines to worship an image of Bel (Baal), and when the King of Babylon points out how great a quantity of food the image consumes each day, Daniel has all the entrances to the temple closed, first sprinkling the floor with fine ashes. In the morning footprints show that the food has been removed by the priests through a secret door. Whereupon the king has the image destroyed and the priests put to death.

This has been described as the first detective story. It continues thus:

Daniel refuses to worship a dragon, which he kills by throwing a ball of pitch down its throat. Yielding to the angry people, the king has Daniel cast into a den of lions, where for 6 or 7 days Daniel lives unharmed. On discovering this the king has Daniel's accusers thrown in and devoured, while Daniel is released.

Béla, name of 4 kings of Hungary in the Arpad dynasty. B. I., 1061-8, who succeeded his brother Andrew, encouraged trade, pacified the country, consolidated Christianity, and introduced the representative system into the diet. B. II, known as the Blind, 1131-41, succeeded his second cousin, Stephen II, and was the son of the pretender, Almus. The kingdom was administered by his wife, Helena of Siberia, at whose instigation the ministers of the preceding king were massacred at the diet of Arad. B. III, 1173-96, was grandson of B. II, and succeeded Stephen III. He had been educ. at Constantinople, and introduced Byzantine customs into Hungary. B. IV, 1235-70, grandson of B. III, deposed and succeeded his father Andrew II. He was a supporter of the freemen against the great nobles, whose power he attempted to break. In 1241 and 1261 Hungary was overrun by the Tatars, and B. successfully resisted both invasions, though in return for Austrian help he had to surrender some ter. to the Duke of Austria.

Belasco, David (1853-1931), Amer. dramatist, b. San Francisco, son of Humphrey Abraham B., an Eng. Jew. He appeared at the Metropolitan Theatre, San Francisco, in 1874 as the young Duke of York in *Richard the Third*. Later he was stage manager of the Madison Square Theatre in New York, but he is best known for his original plays. These

include *Hearts of Oak*, 1880, *La Belle Russe*, 1882, *May Blossom*, 1884, and *Valerie*, 1886. After these came 4 plays in collaboration with H. D. de Mille, including *The Wife*, 1887, and *Lord Chumley*, 1888. Then, among others: *Madame Butterfly*, of which the plot was taken from John Luther Long's novel, 1900; *Du Barry*, 1901; *The Darling of the Gods* (with J. Luther Long), 1902; *The Girl of the Golden West*, 1903.

Belaya, navigable riv. in the E. of European Russia, left trib. of the Kama, rising in the Ural Mts, some 800 m. long. Its chief port is Ufa.

Belaya Tserkov' (Ukrainian *Bila Tserkva*), tn in Kiev Oblast of the Ukraine, 60 m. SW. of Kiev. It has food industries. Pop. (1956) 43,000, before the war half Jewish. Known since 1155, it was a centre of Ukrainian Cossacks in the 17th cent.; it became Russian in 1793. There have been sev. Jewish pogroms since 1648.

Belcher, Sir Edward (1799-1877), Eng. admiral. He was present at the bombardment of Algiers in 1816, and took part in the 1825 expedition to explore the Bering Strait. He took part in the war in China, 1840-1, and in 1852 was given command of the unsuccessful expedition to search for Sir John Franklin.

Belcher, George Frederick Arthur (1875-1947), painter and illustrator, son of a doctor of medicine. He was educ. at King Edward VI school and went to Gloucester school of art. He made a reputation as a painter of still life and *genre* and as a humorous draughtsman. It is for his studies of London life that he will be chiefly remembered, his humorous drawings being a familiar feature of *Punch*, the *Tailor*, and other periodicals. His favourite characters, generally drawn with an element of caricature, were charwomen, public-house loafers, and the like, whose sharp Cockneyisms supplied the aptest captions while really reflecting these strata of London life. B. also produced serious figure drawings such as his etchings of James de Rothschild and Sir Frederick Ponsonby with backgrounds illustrative of their activities. In oils B.'s interests were also chiefly in low-life character portraiture. A.R.A., 1931; R.A., 1945.

Belcher, James (1781-1811), Eng. prize-fighter, b. Bristol. He was put to the trade of a butcher, but his local success as a pugilist soon induced him to follow that career in London. In 1803 he lost an eye while playing racquets. He was defeated by H. Pearce in 1805 and in 1807 by Tom Cribb. Soon after this he became a publican in Soho, where he died.

Belcher, John (1841-1913), architect, b. London, son of an architect. After some travel abroad, he joined his father. His earliest work shows the influence of the Gothic Revival prevailing at the time; but all his later buildings have a monumental and Rom. character, doubtless the result in part of the great book on *The Later Renaissance in England* which he was then compiling with Mervyn Macartney. His chief designs were:

The Institute of Chartered Accountants, Moorgate Street, 1890; Colchester Town Hall, 1902; Electra House, Finsbury, 1902; Holy Trinity Church, Kingsway, 1909; Whiteley's Store, Bayswater, 1912. He was President of the R.I.B.A., 1904-6, and was elected R.A. in 1909.

Belcher, Jonathan (1681-1757), Amer. administrator, b. Cambridge, Massachusetts, and graduated at Harvard, 1699. In 1730 he was appointed governor of Massachusetts and New Hampshire: his freedom of thought made him many enemies, who went so far as to forge letters to encompass his ruin: the influential people of New Hampshire, who wanted a separate gov., were opposed to him, and he was superseded in 1741. In 1747 he was appointed governor of New Jersey, an office he held till his death.

Beled, or Balad, Arabic word signifying a tn, prov., or country, occurring in many E. geographical names, e.g. Beledulgerid — Baladal-Jarid, or the country of palm-trees.

Belém, tn of Portugal, at the mouth of the Tagus (q.v.), a W. suburb of Lisbon (q.v.). It has a magnificent Gothic monastery (now an orphanage), which belonged to the Hieronymites (q.v.), and which commemorates Vasco da Gama's (q.v.) discovery of the sea route to India. Da Gama and Camoens (q.v.) are buried in the church. The palace of B. is the residence of the President of Portugal.

Belem, or Pará, cap. of the prov. of Pará (q.v.), Brazil. Situated with a good harbour on Pará R. it exports various tropical products. It was founded in 1616 to secure the Amazon against the English, Dutch, and French. The modern city contains many fine buildings, including a cathedral, bishop's palace, and gov. house. Pop. 230,200.

Belemnites, fossil dibranchiate cephalopod molluscs, allied to the squids and cuttlefish (Sepioidae) and octopuses (Octopoda); they are common in Mesozoic rocks. Fossil B. represent the internal shell of the animal's body, but the guards alone are usually fossilised; long ago they were thought to be thunderbolts.

Belfast, city, co. and parl. bor., and cap. city of N. Ireland. It is 112½ m. N. of Dublin by rail and is a railway centre, connected with other parts of Ireland by the Great N. Railway and the Ulster Transport Authority. Situated at the entrance of the R. Lagan to B. Lough, B. is a seaport of the first rank; regular passenger communication is maintained with Liverpool, Heysham, Glasgow, and Ardrossan, and, through the port of Larne, with Stranraer; there is also a goods ferry service through Larne to Preston, and air services to London, Manchester, Liverpool, Birmingham, Glasgow, and the Isle of Man. On the landward side it is surrounded by mts. The city, in its earliest days, was a crossing place of the R. Lagan near its mouth, hence its name 'Bealfearset', the ford at the sand-bank. A castle was built about 1177 by John de Courcy to support the greater Carrickfergus Castle a few miles

away; it was destroyed and rebuilt on sev. occasions. In 1316 both tn and castle were destroyed by Edward Bruce. At the beginning of the 16th cent. B. was a mere vil. owned by the O'Neill family. Hugh O'Neill lost it in 1571 to Sir Thomas Smith, a favourite of Queen Elizabeth I; he in turn forfeited it to Sir Arthur Chichester, who became Baron Chichester of B. in 1612. B. received a charter in 1613, and under Wentworth's wise policy started on a career of prosperity and progress, which came to its height with the rise of the shipbuilding and linen

Academical Institution, Campbell College, and the Stranmillis Training College. In addition to the public and univ. libraries, the Linenhall Library, founded in 1788, still flourishes as a subscription library. The grounds of B. Castle, presented to the city by Lord Shaftesbury in 1934, lie on the slopes of Cave Hill, as do the public parks of Hazelwood and Bellevue, where there is a municipal zoo. The harbour of B. is under the management of the B. Harbour Commissioners, estab. by the B. Harbour Act in 1847. Extensive reclamation of land is continuously carried



The British Travel and Holidays Association

BELFAST: THE CITY HALL

industries in the 19th cent. The centre of the city is a memorial to the skill of Ulster engineering, for it is built on reclaimed 'slob-land,' the larger buildings being supported on piles sunk deep into alluvial deposits. Although B. is a comparatively modern city (its pop. in 1851 was only 87,062) it possesses some fine buildings, including the city hall (1906), the royal courts of justice (1933), the college of technology (1901), the museum and art gallery (1929), the public library (1888), the harbour office (1896), Broadcasting House, Queen's Univ., St Anne's Cathedral (1904), and Parliament Buildings, Stormont (1932). The univ. was founded as Queen's College in 1845 and received its royal charter as an independent univ. in 1909. B. also contains Presbyterian and Methodist colleges and sev. schools, including the Royal B.

out, the B. harbour airport being opened on reclaimed land in 1937. The harbour has a quayside of 35,411 linear ft, and an area of over 4 sq. m. of land and water, including 5 graving docks, the Thompson Dock being one of the largest in the world. In 1952, 8194 vessels were cleared from the port, with a total tonnage of 4,605,268. B. is an important centre for ship and aircraft building, for the manuf. of linen, rope, tobacco, and mineral waters, and for food canning. The shipyards have employed up to 30,000 men and in 1952 the gross tonnage of ships launched was 130,000. Irish linen, most of it exported from B., is famous throughout the world. B.'s other chief exports are potatoes, livestock, flour, and grain. B. was created a city in 1888 and a co. bor. in 1899. In 1892 the title of lord mayor was conferred upon the mayor of the city, and, in 1923,

the right to preface that title by the words 'The Right Honourable.' B. returns 4 members to the U.K. Parliament and 20 to the N. Ireland Parliament, including 4 from Queen's Univ. The first Parliament of N. Ireland sat in the city hall in B., the state opening being performed in 1921 by King George V. Parliament Buildings at Stormont, the present seat of gov., were opened by the then Prince of Wales in 1932. Queen Elizabeth II (then Princess Elizabeth) and the Duke of Edinburgh received the freedom of the city during their visit to N. Ireland in 1949 and made a state visit to Belfast in July 1953. B. suffered extensive damage during air-raids in April and May 1941. Pop. 443,670. See G. Benn, *A History of the Town of Belfast*, 1877; R. M. Young, *Historical Notices of Old Belfast*, 1896; D. J. Owen, *History of Belfast*, 1921; E. E. Evans, *Belfast, the Site and the City*, 1944; *Planning Proposals for the Belfast Area* (H.M.S.O.), 1945; R. Hayward, *This is Ireland: Ulster and the City of Belfast*, 1950; *Belfast in its Regional Setting: a Scientific Survey* (British Association for the Advancement of Science), 1952.

Belfast Lough, inlet on the E. coast of N. Ireland, situated between the tns of Autrim and Down. It is an estuary of the Lagan, and is 7 m. wide at its mouth. It extends 15 m. inland, and has the tns of Belfast, Carrickfergus, Holywood, and Bangor on its shores.

Belford, tn and par. of N. Northumberland, England, 14 m. NNW. of Alnwick, and the centre of B. rural dist. It was once the scene of constant border raiding; later it became known as a famous fox-hunting centre. Pop. 900 (approx. 1954).

Belfort, Fr. tn, cap. of the Territoire de B. (part of the pre-1871 Haut-Rhin), on the Savoureuse, in the depression called the Trouée de B., between the Vosges and the Jura. It dates from Rom. times, was ceded to France by Austria in 1648 (see WESTPHALIA, 'TREATY OF'), and was fortified by Vauban (q.v.). It has suffered many sieges, including a siege of 3 months' duration in the Franco-Prussian War (q.v.). Throughout the First World War, B. was the right-hand pivot of the allied line on the W. front (see FRANCE and FLANDERS, FIRST WORLD WAR CAMPAIGNS IN). In the Second World War there was again fighting here. B. has textile and machinery manufs., and a trade in wine and grain. Pop. 36,000. (Area of Territoire de B. 235 sq. m.; pop. 87,000).

Belfry, term originally applied to a tower used in medieval warfare, later a watch-tower, or one from which an alarm bell was rung, and finally a bell-tower, usually confined to eccles. buildings. It generally is part of the church, but is sometimes a separate building, as with the It. campaniles. Such B.s are found in England at Evesham, Berkeley, Chichester, Beccles, and sev. places in Cornwall and Scotland, where the church stands in a glen, the B. then being placed on the hillside above it. Municipal B.s,

attached to the tn hall, are common on the Continent, as at St Quentin, Douai, Brussels, etc., and are also found at Glasgow and Aberdeen. The famous B. at Bruges has a carillon of 48 bells. The framework of a B. is made to rest either upon stone corbels or upon recesses in the wall, in order to mitigate the effect of the vibration upon the masonry. The higher the bells are hung the more this is felt. See also BEFFROI.



THE BELL-TOWER AT EVESHAM, WORCS

Belgae. The historical B. seem to have been formed in the 2nd cent. BC by the fusion of Celtic and Gormanic tribes in the region of the Lower Rhine. Caesar, in *De Bello Gallico*, is the main authority regarding the Belgae in Gaul, the references in I, i; II, iv; and V, xii being the most important. According to Caesar, the B. inhabited one of the three great parts of Gaul, that N. and E. of the Seine and Marne. They were the bravest because they were farthest from the civilisation and refinement of Rom. culture, and they had conquered the previous Celtic inhab. of their territories. Following Gormanic aggression, and later in revolt against the conquest of Rome, the B. invaded Britain, and their coming bridges the period between the prehist. and hist. of that country. In archaeology, they are regarded as belonging to the third phase of the Early Iron Age, that is Iron Age 'C.' The first group

arrived about 75 BC in Kent, where the cremation cemeteries at Aylesford and Swarling throw much light on their culture, and then spread northwards over the Thames. About AD 10 their cap. was set up at Colchester (q.v.) under the famous King Cunobelin (q.v.). The second group entered Wessex about 50 BC, and spread westwards perhaps as far as the Bristol Channel and the lower reaches of the Severn. The B. in Britain were far removed from the savage tribes described by Caesar. With their heavy ploughs they extended the range of cultivated land; their rulers minted their own inscribed coins, and industry and an organised political life flourished. The decorative art exemplified by metal work and pottery is especially noticeable. The archaeology of the Iron Age in Britain, in which the B. play an important part, is under constant study and it has a highly specialised bibliography. The main source is still Hawkes and Dunning, 'The Belgae of Gaul and Britain,' in *Archaeological Journal* LXXXVII for 1930; recent views are set out by C. A. R. Radford in *Proceedings of the Prehistoric Society* for 1954, 1.

Belgard, see BIALOGARD.

Belgaum, tn of Bombay State, India. The tn is situated 2500 ft above sea level, and contains an old fort and two fine Jain temples. Under Brit. rule it was a military centre.

Belgian and Dutch Architecture may be considered here as a whole, for the present state of Belgium only dates from 1830, when it was separated from the Kingdom of the Netherlands, estab. in 1815. Before that date the two countries had formed part of larger empires from time to time, and were subject to architectural influence from France on the S. and from Germany on the E. Both became rich during the Middle Ages, but both—especially Belgium—have suffered much damage to historical buildings during times of war. Ever since the Reformation Holland has been predominantly Protestant, whereas Belgium has remained predominantly Catholic.

Though both countries were included in the Rom. Empire, no Rom. buildings of note survive. Christianity arrived late on the scene, and the earliest important historical monument is the nave of the cathedral at Tournai (1070). The transept and towers of that cathedral are about 80 years later. Other Romanesque buildings are very scarce. The prin. surviving Gothic buildings are the cathedrals of Antwerp, Bruges, Brussels, Ghent, Louvain, Malines, and Ypres; the tn halls of Bruges, Brussels, Ghent, Louvain, and Oudenarde; the battered Cloth Hall at Ypres; the lovely church of Notre-Dame du Sablon at Brussels; and the collegiate church at Huy—all these in Belgium; the cathedrals of Dordrecht, Haarlem, and Utrecht; the tn halls of Middelburg and Veere—all in Holland; also picturesque gabled houses in both countries.

The Renaissance movement from Italy reached Belgium and Holland late. It is

natural that its earlier works closely resemble our 'Elizabethan' and 'Jacobean' buildings, for Eng. architects of that period derived many of their ideas from Flem. Dutch, and Ger. books. Picturesque examples of this style are to be found in gabled house fronts all over the two countries, and also in some civic buildings, e.g. the meat market at Haarlem (1603), the tn hall at Leyden (1579), and the steeples of many churches. The tn hall of Antwerp (1565) is a more conservative design, but its central gable, its mullioned windows, and its bold carves give it a Flem. picturesqueness. The Mauritshuis (1630) at The Hague, the Huis ten Bosch (1645) not far away, and many of the quiet streets of Haarlem, Amsterdam, and other Dutch cities, recall the dignified domestic architecture of Wren, built in the days of 'Dutch William.'

Baroque architecture, favoured in all the Catholic countries of Europe, made little appeal to the Dutch, who stripped all trappings from inside their churches after they became Protestant at the Reformation; but in Catholic Belgium there was great activity, not only in building new churches at Antwerp (Jesuit church, 1614-21), Brussels (Notre-Dame du Béguinage, 1664), Louvain (St Michel, 1650), Namur (St Loup, 1621-53); but in decorating existing churches internally with ornate pulpits, confessionals, and altar-pieces.

The wonderful row of Guild houses in the Grande Place at Brussels, erected between 1697 and 1752, are baroque or rococo in character.

B. and D. A. of the 19th cent. calls for little comment. The Bourse at Brussels (1874) is typical of Fr. architecture of the period. Neither the overpowering Palais de Justice at Brussels (1866-83), nor the railway station at Amsterdam (1889, by Cuypers), nor the grandiose Palace of Peace at The Hague (finished 1913) can find many admirers to-day. From Holland, however, has come some of the impulse that created the so-called 'Modern Movement in architecture' early in the present cent. One of the pioneers of that movement was H. P. Berlage (q.v.), designer of the Bourse at Amsterdam (1899-1903); and a prominent leader of the movement was W. M. Dudok (q.v.), most of whose work was done in Hilversum. The extensive housing schemes carried out in Holland after the First World War aroused great interest, as did some of the factories and dept stores built at the same period. The rebuilding of Rotterdam since the Second World War has been notable.

Belgian Art Museums. The Antwerp Museum of Fine Arts was built in 1890 to house the Rubens and Van Dyck collections consisting of paintings from suppressed religious foundations and churches, from the Steen Museum, and from the tn hall, together with numerous engravings and photographs. Like the Palais des Beaux Arts in Brussels, the Antwerp Museum is rich in pictures by Van Eyck and Rogier van der Weyden,

in the earlier period, as well as in paintings of the great florid period of Rubens. Notable among the paintings here are Van Eyck's 'St Barbara,' painted as far back as 1437, and 'Madonna of the Fountain,' of the same period, and Van der Weyden's 'Seven Sacraments.' But pride of place is naturally given here to Rubens and Van Dyck, both men of Antwerp—as indeed was also Jacob Jordaens, who is well represented by his 'Family Concert,' and boldly imaginative 'Last Supper.' Among the Antwerp Museum's outstanding examples of Rubens's prolific art are the triptych of St Thomas with contemporary portraits of the donors in the wings and the 'Descent from the Cross'—regarded as the masterpiece of the gallery—the huge 'Adoration of the Kings,' and 'Christ Crucified between Two Thieves.' In a different mood is his 'Venus Frigida.' There are many typical portraits by Van Dyck, including that of Charles II of England as a child. Other notable pictures are Memling's famous 'Heavenly Choir,' the 'Salome' of Quentin Matsys, 'Cornelis de Vos's portrait of the old guildsman, Jan Steen's 'Dutch Wedding Feast,' and pictures by Brueghel, Brouwer, Coques, Abel Grimmer, Hals, Hobbema, De Hooch, Rembrandt, Schaleken, Ter Borch, Van de Capelle, Van Goyen, De Vries, and Vermeer.

Among outstanding Flem. pictures, apart from the works of Rubens, in the Palais des Beaux Arts, Brussels, are Memling's 'Martyrdom of St Sebastian'; a 'Virgin and Child' by Gerard David; an 'Annunciation' attributed to 'the maître de Flémalle' (Robert Campin); and a beautiful 'Holy Family' by Hugo van der Goos. Rubens, however, outshines all others here, the primo favourite being his great 'Adoration.' Other great pictures of his are the 'Assumption of the Virgin' and 'Venus at the Forge.' There are also a number of his sketches for paintings. The Brussels Van Dycks include representations of St Francis of Assisi and St Anthony of Padua. Among the finest paintings by Jordaens is his 'Pan and Syrinx.' Here too are works by Nicholas Maes, a rare painter outside Holland, and the 'Weaver's Repose' by Ostade; 'The Gift' (a landscape) by Wynants; and pictures by the Brueghels, Snyders, Cornelis de Vos, Gaspard de Crayer, Ter Borch, and also some pictures by the Eng. school—Reynolds, Raeburn, Constable, and Lawrence.

Belgian Congo, see CONGO, BELGIAN.

Belgioiosa, It. tn in Lombardy (q.v.), 8 m. E. of Pavia (q.v.). Pop. 4500.

Belgioioso, Cristina, Princess of (1808–1871), It. patriot and authoress; *b.* Milan, she was the daughter of the Marquis Trivulzio, marrying the prince of Belgioioso. In 1848 she supported the It. revolution, and at her own expense raised a troop of volunteer patriots. On the defeat of her party in the following year her property was confiscated and, an exile, she returned to Paris, where she lived till 1861. She *d.* at Milan. *See* life by H. R. Whitehouse, 1906.

Belgium (Fr. Belgique; Flem. België),

country of NW. Europe. Since 1830 constituted as an independent kingdom, it was anciently a part of Gallia Belgica, so called from the tribe the Belgæ (q.v.). It is bounded on the N. by the Netherlands, on the S. and SW. by France, on the E. by Luxembourg and Germany, and on the NW. by the N. Sea. It lies between lat. 49° 30' and 51° 30' N. and long. 2° 33' and 6° 25' E., and has an area of about 11,775 sq. m., about one-eighth of the area of Great Britain. Its greatest length is a line drawn from Ostend to Arlon, about 174 m. B. is divided into 9 provs. (see under *Population*). Its cap. is Brussels (Fr. Bruxelles). In general B. is a flat country; the greatest height to which any elevation rises is about 2270 ft. In the S. and E. it takes the general aspect physically of N. France, while in the N. and NW. it resembles the Netherlands. A continuation of the Ardennes uplands separates the riv. valleys of the Meuse and the Moselle, and extends in a NE. direction into the Rhineland. The provs. of Liège, Luxembourg, and Namur are divided by numerous ravines and streams, by valleys and ridges of hills. The vegetation is poor and the country in this part is covered with forests, which become less extensive as approach is made to the coast. The N. and W. provs. consist of well-watered and extensive plains, which are easily cultivated. In the provs. bordering the sea and the lower Scheldt the inundations of the sea are only kept back by the dykes which have been built. Nearly 200 sq. m. of land are thus artificially protected from the inroads of either the sea or rivers. Those lands under sea level are locally called polders.

The shallowness of the N. Sea and the entire absence of coastal indentations are incompatible with the existence of good seaports, though the port of Antwerp to some extent compensates for the disadvantages of the coast. The length of the coastline is 42 m. The sand dunes are a feature of the coast of W. Flanders, and among the well-known watering-places are Ostend, Blankenberghe, Knocke, and Nieuport-Bains.

Rivers and Canals. The waterways of B. fall into 2 great divs., the navigable rivs., such as the Scheldt and the Meuse, and the system of canals. The 2 great rivs. of B., the Scheldt and the Meuse, enter that country from France, where they have their source, and enter the sea in the Netherlands. They are navigable throughout the whole of their course in B., and are supplemented by a number of tribs. which enter them during their course through B., and some of which are themselves navigable. The course of the Scheldt through B. is about 110 m., its prin. tribs. being the Lys, the Dender, the Durme, and the Ruppel. The Meuse has about 115 m. of navigable water in B. and receives in its course the waters of the Sambre and the Ourthe. Another riv. of B. is the Yezer, which enters the sea at Nieuport, and which is navigable for about 30 m. In addition to these systems of natural waterways, the country is also supplied with an excellent

canal system. These canals number 26, and have a total length of over 550 m. The chief canals are from Bruges to Ostend, from Brussels to Charleroi, from Brussels to Willebroeck, and from Ghent to Bruges. The most important is the Albert Canal, 81 m. in length; it runs from Antwerp to Liège, and was constructed for the traffic of 2000-tonners. For connections with the Rhine, riv. navigation has to pass through Dutch ter.

Population. B. is one of the most densely populated countries of Europe. The pop., including Eupen and Malmédy (q.v.), was 8,896,246 at the end of 1955, which may be roughly divided into 5 millions of Flemings and 3½ millions of Walloons, while there are about 70,000 Ger.-speaking Belgians and some 400,000 foreigners. The pop. of Brussels, with 17 adjacent coms., is 1,362,000, of Antwerp with 8 adjacent coms., 547,000. The next tns of importance are Liège and Ghent.

Areas and pop. of the 9 provs. are shown in the table below.

Province	Area. sq. m.	Pop. Dec. 1955
Antwerp	1104	1,362,908
Brabant	1267	1,887,782
E. Flanders	1147	1,249,435
W. Flanders	1248	1,032,169
Hainaut	1436	1,261,125
Liège	1525	994,185
Limbourg	930	528,123
Luxembourg	1705	216,394
Namur	1413	364,125
Total	11,775	8,896,246

Climate. The climate of B. is similar to that of England; it is, however, a little colder in winter and hotter in summer. The SE. part is to be preferred to the damp and hazy atmosphere of the N. and NW. The mean ann. temp. is about 50° F., while the mean ann. rainfall of Brussels is about 28 in., or about 3 in. less than that of London. The rainfall, however, varies from an average of 27 in. on the W. to a little over 40 in. in the E. of the country.

Agriculture and forestry employ well over one-fifth of the working pop. About 4.5 million ac. are cultivated, and there are around 1.4 million ac. of forests, half of which is scientifically exploited under gov. superintendence. Over 60 per cent of the cultivated area is covered by little farms of less than 12 ac. Cultivation in B. is so intensive that the country produces about 80 per cent of its own agric. needs. The chief products are wheat, rye, oats, barley, potatoes, sugar beet, hops, flax, and tobacco. There is an important floriculture in the Ghent region. To improve the breeds and to introduce modern farming methods national, provincial, and local exhibitions of horses, cattle, agric. implements, and produce are regularly held, at which prizes are given. Breeding of live-stock is also an important industry.

Minerals. The mineral wealth of B. is of great importance. Mining employs

175,000 workers. The prin. minerals are coal and stone. The iron deposits are nearly exhausted. The lead and zinc mines, too, are more or less entirely exhausted. Coal is found principally in 2 basins: (i) The S., which may be divided into an E. basin of 100,000 ac., and a W. basin of more than double that area. The chief centres of the W. basin are Mons, Charleroi, and Namur, while the centre of the E. is Liège. (ii) The N. basin, which covers 250,000 ac. of the Limbourg prov. This rich reserve of coal deposits has only been exploited since 1917. The chief centres are Beringen, Genk, and Eisden. The coal found in B. varies from anthracite to the richest of gas coal. The output was 30 million metric tons in 1955 (29.5 in 1938 and 15.7 in 1945). In 1952 the coal and steel (see under *Industry*) resources were combined with those of other W. European countries under the European Coal and Steel Community (q.v.). An increasing proportion of miners are foreign workers, and there is a tendency for the native pop. to leave the mines. The production of freestone, porphyry granite, marble, gravel, limestone, and sand for glass is also of great importance.

Industry. The metallurgic industry is the most important of B. The manuf. of iron is centred in the Sambre and Meuse valleys, which cross the S. coal basin. In 1955 10.57 million metric tons of iron were produced, and 5.90 million metric tons of steel. The Belgian iron and steel industry is influenced mainly by the former large industrial combines of John Cockerill and Ougrée-Marihaye, which were merged into one company (Cockerill-Ougrée) in 1955. There are numerous lead, zinc, copper, silver, and other non-ferrous metal works throughout the country. An important amount of the raw material goes to the Belgian factories producing power installations, locomotives, wagons, ships, weapons, bicycles, motor-cars, cables, and tools of all shapes and sizes. Next to this industry comes the manuf. of textiles, which is now far above its pre-war level. The chief centre of the cotton industry is Ghent. Woollen manuf. is carried on in the region of Verviers. Lünen is the chief industrial product of the Lys valley and the Courtrai area. Lace is made at Brussels, Malines, and Bruges. Other important industries include food, chemicals, leather, glass, furniture, paper, tobacco, pottery, clothing, building, and transport.

Trade. B. being a manufacturing country the import of raw materials and the export of manuf. articles are necessarily complementary. B.'s situation at the cross-roads between other manufacturing countries, its easy communications with the sea, as well as inland, make it also a transit country. Provided with a good canal system and railways covering 6000 m. quick transport is assured. Seven thousand barges are in use for the riv. and canal transport. The Belgian merchant navy was badly affected during the Second World War, but is again increasing in importance. In 1956 it had

reached a total of 84 vessels. Imports and exports for 1955 were as below:

<i>Imports</i>			
Metric tons	49,396,000		
Value:	142,202 million	Belgian	
	frances		
<i>Exports</i>			
Metric tons	30,170,000		
Value:	138,961 million	Belgian	
	frances		

With Luxembourg B. has had a customs union since 1922. In June 1947 an agreement was signed with the Netherlands to join, and in 1948 the Benelux union (q.v.) came into force.

Government and constitution. The gov. is based upon the strictest liberal principles; all power emanates from the people. Justice is free to all, the press is free, the people are surrounded on every side by safeguards designed to ensure to them the proper gov. of their country and their own personal liberty and freedom of conscience. The gov. is a constitutional representative and hereditary monarchy (constitution of 1831). Those sections of the Belgian constitution which regulate the legislative power were revised in 1921. The legislative power is vested in the king, the Chamber of Representatives, and the Senate. Judicial power is exercised freely without dependence upon any authoritative influence and provincial affairs are governed by provincial councils. The royal succession is in the direct male line in order of primogeniture. The right of successors is forfeited by marriage without the king's consent, but may be restored by the king with the consent of both Houses of Parliament. The person of the king is inviolable, and the ministers are responsible for all his acts. He cannot suspend or dispense with the laws. He has power to nominate to all civil and military offices, and he commands both army and navy. He can declare war, make peace, and conclude offensive and defensive alliances and commercial treaties, which he must communicate to the Chambers. He has power in default of male heirs of nominating his successor with the consent of the Chambers. He can only appoint one regent, and under a regency the constitution cannot be altered. The legislature (Chamber and Senate) meets annually in Nov., and must sit for at least 40 days. The king has the power of dissolution, and on dissolution a fresh election must take place within 40 days. The Chamber of Representatives is chosen by the people, and consists of 1 member for every 40,000 inhab. To be a general elector it is necessary to be a Belgian by birth, or to have received the 'grand naturalisation,' to be not less than 21 years of age, and to have resided in the constituency for a minimum period of 6 months. In order to be eligible as a deputy it is necessary to be a Belgian, to live on Belgian soil, to be in full possession of civil and electoral rights, and to be at least 25 years old. For the Senate the minimum age limit is

40 years, and candidates must fulfil one out of twenty special conditions. Each deputy has an ann. allowance of 225,000 francs and a free pass all the year over gov. and companies' railways. Senators receive 144,000 francs per annum. The Senate is composed of: (i) Senators elected directly, their number being equal to half the number of members of the Chamber of Representatives; (ii) senators elected by provincial councils in the proportion of 1 to every 200,000 inhab. of the prov.; (iii) senators co-opted by the Senate itself, equal to half the number of provincial senators. The king has the right of appointing his own ministers. They have the right of access to the Chambers, must appear on request of the Chambers, and may take part in debates. They may vote when they are members. They can be dismissed at pleasure, and may be charged by the House of Representatives before the Court of Cassation. For judicial purposes B. is divided into 26 arrons. and 230 cantons, for administrative purposes into 41 arrons., 211 cantons, and 2670 coms. The provs. and coms. enjoy a considerable measure of local gov. Proportional representation applies to the provincial and communal elections. Each prov. has its prov. council elected at the same time as the members of the legislature. The governor is appointed by the king. Each com. has a council re-elected every 6 years. The council nominates its aldermen. The burgomaster is appointed by the king.

Armed forces. Every Belgian male is liable to military service. The Belgian forces were increased in 1950 to provide troops for the joint N. Atlantic Treaty (q.v.) forces and the W. European Union (q.v.). In 1951 a law introduced a 2-year period of service for conscripts instead of the earlier period of 1 year, but in 1954 it was reduced to 18 months. The armed forces in 1955 numbered 168,000 men. (For the army during the Second World War see under *History*.)

Language. B. is mainly bilingual, the 2 official languages being French and Flemish. Walloon, a dialect of anct France, is spoken by a minority in the S. The Fr. dialect prevails in the S. and the E., the Flemish or Dutch in the provs. of Antwerp, Brabant (N. half), Flanders, and Limbourg. Officially the two languages are equally used. While the educated in Flanders have mostly a good knowledge of the Fr. language—which, to some extent, they prefer to Flemish—the Walloons are not so likely to learn the other national tongue. German is spoken in the E. part of Liège prov. and in the Eupen and Malmédy dists., where French too is generally understood throughout. In 1944, conjointly with the Dutch Gov., it was decided to simplify the written language. Since May 1947 the use of the new rules for the writing of the Dutch language is obligatory in all gov. services. In most schools the new system was being taught a year earlier.

Religion. The religion of the country generally is Rom. Catholic, although full liberty of conscience is granted to all, and

all ministers, no matter of what denomination, are paid by the State. In 1954 there were 6669 Rom. Catholic ministers, 29 Protestant, 17 Jewish, and 9 Anglican. No inquiry about profession of faith is made by the census authorities. The kingdom is divided into 6 Rom. Catholic dioceses, an archbishop having his see in Malines. There are also a number of conventual houses.

Education. Besides primary, secondary, and higher educational institutions,

the State subsidies to Rom. Catholic schools. There are 4 univs. in B. The 2 State univs. at Ghent and Liège were erected under the Dutch Gov. (1816-17). In 1930 the Ghent univ. became a Flem. univ. The Catholic univ. of Louvain was founded in 1426. The free univ. of Brussels dates from 1834. There are also technical, engineering, agric., mining, commercial, military, and navigating schools. In 1923 the Colonial School at Antwerp (estab. in 1920) and the School



Belgian Embassy

SAND DUNES: TYPICAL SCENE ON THE BELGIAN COAST

training colleges, known as Écoles Normales, have been estab. by the gov. and some provs. to train teachers for elementary and lower secondary schools. In addition, confessional schools are run by the Rom. Catholic Church, which has a great influence on the educational system in B. Since 1914 all children from 6 to 14 are bound to go to school, and it is a duty of the State to give this primary education free of charge. Those schools which are subsidised by the gov. are under frequent inspection and the programmes must be in accordance with a model State programme.

In 1955 a new educational bill was passed by the Socialist-Liberal coalition in power, recognising the right of the State to open official secondary and technical schools when needed, and cutting

of Tropical Medicine were constituted a colonial univ., now known as Institut Universitaire des Territoires d'Outre-Mer. There are various royal academies and conservatoires devoted to the fine arts, besides well-endowed museums and libraries, and numerous scientific and literary societies.

Literature. As there is no Belgian language it is impossible to speak about a Belgian literature. Nevertheless Fr. as well as Flem. works were being produced in the Middle Ages. (See also under FLEMISH LANGUAGE AND LITERATURE.) The Fr.-writing authors, Jean Bodel (13th cent.), *Chanson des Sarrasins*, Jean Froissart (1337-1410), *Chronique de France, d'Angleterre, d'Écosse, d'Espagne, de Bretagne*, Philippe de Commines (c. 1447-1511), *Mémoires*, 1464-98, and Jean

Lemaire de Belges (1473-1525), *Illustration des Gaules et singularités de Troie*, took an important part in the formation of Fr. prose in B. After the Middle Ages, with the sustained oppression of other countries, all literary activity ceased for centuries. Only in the 19th cent. did Belgian literature assume a national character, distinct from the French. Charles de Coster (1827-79), with his *Légende d'Uylenspiegel*, the story of a kind of Flem. Robin Hood, was one of the most important precursors of the revival. The combination of the Walloon and Flem. temperament—the one sensitive and delicate, the other meditative, simple, and close to nature—found its expression in the literature that sprang up, mainly under Fr. influence, in the second half of the cent.—in the personal and spiritual poetry of Émile Verhaeren (1855-1916) or the peasant novels of Camille Lemonnier (1844-1913). The latter, although he may have derived much from Zola, may be said to be the first distinctive force in Belgian literature. His *Contes flamandes et wallons* was pub. in 1879, and his best novel, *Un Mûle*, in 1881. Maurice Maeterlinck (q.v.) was b. in 1862 and achieved a European reputation with his mystical and allegorical plays. Later in life he turned to writing essays in which he expressed his thought in more direct fashion. More narrowly Flemish in his outlook, though writing in French, is Georges Rexhould (1854-1927), whose novels and stories were realistic and emotional portrayals of the life of his time. Besides Verhaeren, the other major Belgian poet of the 19th cent. was Georges Rodenbach (1855-98), whose poetry is also Flemish in character rather than French, and Charles van Lerberghe (q.v.) (1861-1907). Among other poets whose work continued into the 20th cent. must be named Albert Giraud, Fernand Séverin, Max Elskamp, Paul Spaak, Henry Carton de Wiart, and Albert Mockel, whilst among the younger writers Émile Cammaerts (q.v.) is pre-eminent. Belgian drama fl. during the 20th cent. under the combined influence of Verhaeren and Maeterlinck. Crommelynck and Vauzyne may be mentioned in this connection. The First World War gave an added impetus to the Fr. literature of B., and the Académie Royale de Langue et de Littérature Française de Belgique was founded in 1920. During the thirties, however, the tendency was more towards literature becoming independent of Fr. influence, while at the same time Fr. critics came to value the individual merits of Belgian writers, among whom Charles Plisnier, Pierre Bourgeois, Marie Gevers, Henri Michaux, André Baillon, Franz Hellens may be named from a generation of distinguished poets and novelists whose reputations date from the years before the Second World War.

History. The hist. of B. as an independent kingdom dates from the 1830 revolution, but its hist. as part of the Netherlands goes back to the time of the Romans. The ter. covered by B. to-day was already inhabited in the early Stone

Age (Palaeolithic). Accounts of modern research in prehistoric and Rom. B. may be read in the various bulletins of the Académie Royale de Belgique, and in the pubs. of the Cinquantenaire Museum, Brussels. Recorded hist. starts with the conquest by Caesar. In the Rom. period it formed part of Gaul, and was distinguished by the name of Gallia Belgica. It was inhabited chiefly by Celtic tribes, although there were many traces of tribes of Germanic origin. By the influx of the Franks into this part of the country the Ger. tribes were increased, and it is the hist. of the Franks in Europe that forms the early hist. of the Netherlands. The Salic Franks settled in the region between the lower Rhine and the N. Sea. At the end of the 5th cent., under Clovis, they had conquered the whole of Gaul (France). In the beginning of the 9th cent. the whole country formed part of the empire of Charlemagne. After his reign his empire was gradually divided. Flanders and the W. provs. went to France, the E. provs., including Brabant, to Germany. During the feudal Middle Ages different hereditary counties, duchies, bishoprics, and lordships were estab. In the meantime the tns rose to power. Flanders with its cities became one of the most important counties, and had to struggle constantly against France to maintain her independence. Towards the end of the 14th cent. the line of Flem. counts became extinct, and their ter. passed into the hands of the Dukes of Burgundy, and at the beginning of the 15th cent., through various marriages and by inheritance or purchase, all the provs. became united, and the industry of the Netherlands fl. greatly. In 1477 the daughter of Charles the Bold, Mary, married the Archduke Maximilian. In this way began the connection of the Netherlands with the house of Austria. The Netherlands were passed on by the emperor to his son Philip, who married the daughter of Ferdinand and Isabella of Spain, and was the father of the Emperor Charles V. Dying before his father, Philip left the Netherlands to his son, by whom they were incorporated with the Sp. crown, and who began the connection of the Netherlands with Spain which lasted up to the treaty of Utrecht, 1713. During the reign of Philip II the N. provs. broke away from Spain, but the area of the Netherlands now known as B. remained under Sp. rule. In the cent. which followed, dist. after dist. was ceded to France during the wars with Spain and following the war of Devolution. By the treaty of Ryswick (1697) a great amount that had been lost at Nimègen (1678) was restored. By the treaty of Utrecht, which concluded the war of the Sp. Succession, the Sp. Netherlands were ceded to Austria. During the cent. which followed, the fortunes of the Austrian Netherlands underwent many vicissitudes. In the war of the Austrian Succession they were overrun by France, but all conquests were restored by the treaty of Aix-la-Chapelle of 1748. The Seven Years War left them unmolested, and under Maria Theresa they prospered.

But Joseph II, the enlightened despot, roused anger by his reforms and danger by his attempt to open the R. Scheldt, and before his death a revolt had broken out in the Austrian Netherlands which had to be subdued by an Austrian army. Then followed the Fr. Revolution and Napoleon. The battles of Jemappes and Fleurus placed the Austrian Netherlands in the hands of the French, the treaty of Campo Formio (1797) confirmed that possession, and for the rest of the Napoleonic period they became to all intents and purposes an integral part of France, ruled by the Code Napoleon. After the abdication, 1814, they again passed to Austria, and were administered by an Austrian governor-general, but in 1815, by the Congress of Vienna, they were united to Holland, and William Frederick of Nassau became King of the Netherlands (i.e. the modern Netherlands and the modern B.), taking the oath in Sept. 1815. It was an unfortunate alliance, for the two communities were separated by cents. of tradition, and, to a large extent, by racial, linguistic, and religious differences. Though the Belgians prospered, discontent increased, engendered by suspicion that the Dutch language was being forced on them. When the revolution of 1830 was successful in Paris the revolutionary spirit seized the Belgians, and the cry 'Imitons les Parisiens' roused them to successful imitation of the citizens of Paris.

The Belgians again declared in favour of independence and were successful in defeating the forces of the Dutch. At a congress of the 5 great powers held in London, it was agreed that the country of B. should be independent, that it should be a constitutional monarchy, not a rep., and that the Orange Nassau family should be permanently excluded. The election of Leopold of Saxe-Coburg was the signal for a fresh Dutch invasion. The crisis was terminated in 1839 by the action of the great powers, who forced a settlement which was in effect the treaty of XXIV Articles, drawn up 8 years before. By its terms B.'s share in the national debt of the Netherlands was reduced and the ters. in dispute were partitioned, but to compensate for territorial losses the neutrality of B. was guaranteed. It was this treaty which became known as 'the scrap of paper.' From 1839 to 1914 B. maintained its independent neutrality. From about 1850 the constitutional party began that series of reforms which gained for B. the position of one of the freest countries in Europe. The question of Luxembourg threatened the peace of Europe in 1867, and B. took part in the congress which prevented war breaking out. In 1870, on the outbreak of hostilities between France and Germany, B., fearing invasion, mobilised her troops, but her neutrality was recognised. In 1885 the Congo Free State was acknowledged to be under the presidency of the King of B., Leopold II, and it became a Belgian colony in 1908. Leopold II d. in 1909, and was succeeded by his nephew, Albert.

At the beginning of his reign King Albert was credited with progressive sympathies, and in 1913 a general strike was called with the object of obtaining equal manhood suffrage and the abolition of the system of plural votes. In 1899 proportional representation had come into being, but it was not until 1918 that plural voting was abolished. Manhood suffrage was estab. 1921. Women obtained the right to vote at the parl. elections in 1948. Although the majority of the people relied on the 1839 treaty, especially as it had been respected during the Franco-Prussian war in 1870, it had been the policy of Leopold II to make B. secure from invasion, and this policy was also adopted by Albert. Leopold had encountered parl. opposition in obtaining the credits necessary for the fortification of Liège, Namur, and Antwerp, and although under Albert compulsory military service was estab., it had not had time to take effect before B. was invaded by Germany on 3 Aug. 1914. The reduction of Liège (see *LIEGE*) took the Germans 12 days, and the Belgian army was driven back to Louvain, whence it was further driven back to Antwerp. Louvain was looted (see *LOUVAIN*). On 20 Aug. a Ger. army under von Kluck entered Brussels, while another army under von Bulow subdued the fortress of Namur. The way to France now lay open, but the Ger. army was harassed by the Belgians, who were entrenched at Malines and Antwerp. On 10 Oct. Antwerp surrendered after a successful withdrawal of the army to the W., and the whole of B. was occupied by the Germans save for the small SW. corner from Nieuport to Ypres. B. was now under Ger. military occupation, and von Bissing was made governor. After a period of terrorism, attempts were made to set industry going again. Men who would not work for the benefit of the enemy were deported, and from 1916 to 1917 nearly 150,000 men were sent to work in Germany. When it was found in 1917 that the passive resistance of the workers could not be broken, Belgian industry was dismantled and many of the machines were transported to Germany. One aim of von Bissing's policy was to divide B. against itself by supporting the Flem. movement and to corrupt the loyalty of the Flemings by setting them against the Walloons. The assumption was that B. was an artificially created state without any real national unity.

Meanwhile the remains of the Belgian army were stationed on the extreme left of the allied front, and withstood severe fighting in the valley of the Yser. (See *FRANCE AND FLANDERS, CAMPAIGN IN*.) After the fall of Antwerp the coast towns of Zeebrugge and Ostend had fallen into Ger. hands, but in 1917 they were rendered ineffective as submarine bases by some ships being sunk by a Brit. squadron at the entrance of the harbours, thus partially closing them (see *ZEEBRUGGE*). The treaty of Versailles, which ended the war, gave B. the status of a sovereign state, free to make what alliances she

wished, but the 1839 treaty guaranteeing Belgian neutrality was abrogated. The logical outcome of this was that B. contracted a defensive alliance with France and England. B. also gained the dists. of Eupen and Malmédy, and the com. Moresnet, ceded by Germany, thus adding 380 sq. m., which in 1925 were made part of the prov. of Liège.

At the end of the Ger. occupation B. was faced with the task of reconstruction. Belgian industry, which had always been a formidable competitor with Germany, had been designedly disabled. In the 10 years following the war reconstruction was rapid. B. weathered a serious financial crisis in 1925-6. As a drastic measure the gov. obtained plenary powers, and rehabilitation was brought about by the 'industrialisation' of the State railways and the telephone and telegraph services.

A conspicuous feature of Belgian politics after the First World War was the rise of the Socialist party, which soon won a large proportion of the working-class vote. In 1925 the Socialists forced a general election, and gained such success that in July 1925 Pouillet formed a Socialist-Catholic coalition gov., in which Vandervelde, the Socialist leader, was foreign minister. It was he who signed on behalf of B. the ill-fated Locarno treaty, the aims of which he had done much to further. In May 1938 Spaak (q.v.) became B.'s first Socialist premier.

In 1929 there was a crisis over the language problem. In 1930 the univ. of Ghent was made Flemish, and provision was made for the teaching in schools to be given in the language prevalent in the dist. Both French and Flemish are now official languages.

On 17 Feb. 1934 King Albert was killed while mountaineering alone in the Meuse valley and was succeeded by his son, Leopold III. The latter's first wife, Queen Astrid, was killed in a motor accident at Lake Lucerne, 29 Aug. 1935.

Since 1925 B. had placed its faith in the Locarno treaty, and supported the policy of collective security. In 1936, however, Germany's repudiation of Locarno increased Belgian fears of another European conflagration, and the failure of the League of Nations successfully to impose sanctions against Italy in the same year produced in B. a tendency away from collective security towards isolation, self-dependence, and rigid neutrality. Consequently at the end of 1936 King Leopold gave a new direction to Belgian policy. With the concurrence of Great Britain and France, B. was released from its Locarno obligations, and at the same time received from the 2 W. powers a unilateral promise of support in the event of aggression. Some months later, on 13 Oct. 1937, Germany also confirmed the inviolability of B., and undertook to respect Belgian ter. except in the event of Belgian participation in military action directed against Germany. It followed from the policy of neutrality and rejection of military alliances that B. should increase its dependence on its own armaments, and

expenditure between 1936 and 1940 was the highest in Belgian hist. On 26 Aug. 1939, 5 days before the Ger. invasion of Poland, the Ger. ambas. to B. repeated his country's assurances of respect for the integrity of B., and on the outbreak of war on 3 Sept. B. reaffirmed its strict neutrality.

On 10 May 1940, before dawn, the Ger. Air Force launched an attack on selected airfields and centres of communication. King Leopold took over command of the army, and the Belgian Gov. ordered



E.N.I.

FLEMISH PEASANT GIRL MAKING
BRUSSELS LACE

general mobilisation and declared martial law. On 28 May the Belgian Army capitulated on King Leopold's orders. The Belgian premier, Pierlot, however, broadcasting from Paris, declared that Leopold's capitulation had no legal validity, and that his decision had been taken against the will of his ministers, that Belgian officials were thenceforth absolved from their oath of allegiance to the king, and that B. would continue the struggle at the side of the Allies. The Belgian Gov. soon moved to London and was regarded as the legal gov. of B., not only by all the Allies, but also by neutral states. Meanwhile the Germans confined King Leopold in Laeken Castle.

All through the occupation the Belgians were sustained by confidence in their ultimate liberation and numbers of Belgians fled to England to serve in the forces there, or to find civilian employment. For information on the fighting in B. during the Second World War see

FLANDERS, BATTLE OF and WESTERN FRONT IN THE SECOND WORLD WAR.

On 2 Sept. 1944 Brit. armoured units reached Tournai, the first Belgian town to be liberated, and Brussels was freed on the following day, 3 Sept. Belgian forces co-operated with the Brit. and Amer. armies, and by 3 Nov. the whole of B. was liberated, following the end of the final Ger. resistance at Zeebrugge and S. of the Scheldt. In April 1949 some minor frontier modifications in B.'s favour were made on the Belgian-Ger. frontier.

With the overthrow of the enemy Europe faced a long process of readjustment, and progress was slow. Of the countries in W. Europe the one to show the greatest progress the most quickly was perhaps B., where a relatively high degree of political and economic stability was attained. But the issue of the return of King Leopold III soon threatened to divide the country. In the final stages of the war the Germans had removed the king and his family to Germany. On his liberation by the Allies, he wished to resume his functions. The resistance movement, which naturally was a strong influence in the country, had become predominantly associated with the left, and was opposed to the return of the king, who, in the opinion of many, was associated with undue subsmissiveness to the Germans. His second marriage was also highly unpopular. In view of this hostility, therefore, the Belgian Gov. refused to take responsibility for the return of the king. Hence the country remained under the regency of Prince Charles, the king's brother, who had been appointed regent after the liberation of B., when Leopold was still in Germany. In 1949 the Socialists lost control of the gov. In 1950 the Christian Socialists, committed to support for the king's return, held a referendum on the subject, which produced a majority in favour of Leopold's restoration. But it was not a large majority and in the Walloon dists. more votes were cast against the return than for it. The regency was ended, and Leopold returned to B. Rioting and strikes broke out and civil war and a possible div. of the country seemed imminent. In Aug. 1950 Leopold agreed to delegate his powers to his eldest son, Baudouin. He finally abdicated in July 1951, being succeeded by his son as Baudouin (q.v.).

After the Second World War much progress was made in the field of social services, the whole concept of Belgian social security being based on the law of Dec. 1944. This was supplemented by further legislation in 1945 and 1948. B. is a member of Benelux, of the European Coal and Steel Community, and of N.A.T.O. (qq.v.).

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Belgorod ('White Town'): 1. Oblast in central Russia, N.E. of Khar'kov, situated in the central Russian upland, in the black earth belt. It has large iron ore deposits. Area 10,500 sq. m.; pop. (1956) 1,190,000 (Russians and Ukrainians). Sugar-beet, wheat, and sunflowers are grown, and there are food industries and some engineering. The prin. ins are B. and Staroy Oskol.

2. Cap. of the above, 40 m. N. of Khar'kov. It has large chalk quarries. Pop. (1956) 44,000. It has been known since the 13th cent., was the centre of the Muscovite S. defence line in the 17th cent., and in 1913 the scene of bitter fighting between the Germans and the Soviet Army.

Belgorod-Dnestrovskiy (Rumanian Cetatea Alba, Turkish Akkerman, ditto Russian, 1806-1944, Ukrainian Bilhorod), in S. Bessarabia at the Dniester estuary (Odessa Oblast of the Ukraine). Pop. (1956) 22,000 (1885, 41,000; c. 1914, 33,000; 1920, 40,000); Ukrainians, Russians, Jews, Moldavians (Rumanians), Greeks, Armenians. The ant. Gk colony Tyras, in the Middle Ages it belonged variously to Kiev, Galicia, Tartars, Genoese, Moldavians; it became Turkish in

1479, Russian in 1806, and was Rumanian 1918-40, 1941-4. Cap. of Akkerman Oblast 1940-1 (renamed Izmail Oblast).

Belgrade (Serbo-Croatian *Beograd*, the white city; anct *Singidunum*), cap. city of Serbia and also of Yugoslavia. It is built on 7 hills on the r. b. of the Danube and the Sava, at the junction of the 2 rivs.

History. The Rom. tn of *Singidunum*, said to stand on the site of a Celtic settlement, developed into a prin. tn of Pannonia (q.v.). In the 6th cent. it was destroyed by the Avars (q.v.), and reappeared in the 9th cent. as *Beograd*.

archbishop, and has a univ. (1864). Part of the anct fortress on the site of the Rom. *castrum* remains, and there is a 19th-cent. cathedral. It is, in general, a very modern city, having been largely rebuilt since 1945, and has many fine streets and beautiful gardens. There are scientific and literary institutions, art galleries, museums, and 4 large libraries. The tn is a commercial rather than an industrial centre, and is the 2nd largest port on the Danube. Manufs. include textiles, machinery, leather goods, and foodstuffs. Pop. 469,900.



BELGRADE

General view showing the National Theatre.

E.N.A.

Due to its strategic position, B. has been subjected to frequent sieges, and in the Middle Ages was successively Bulgarian, Byzantine, Hungarian, and Serbian. It became the cap. of Serbia (q.v.) at the beginning of the 15th cent. and rapidly developed in importance. The Turks besieged it unsuccessfully in 1456, being defeated by Janos Hunyadi (q.v.), but captured it in 1522 and held it until 1688, in which year it was taken by the Austrians. The Turks took it again in 1690, lost it to Prince Eugene (q.v.) in 1717, and regained it in 1739. They lost it again 1789-91, and finally withdrew in 1867. It was occupied by the Austrians for most of the First World War. During the Second World War the tn was severely damaged by Ger. air bombardment, and was occupied by the Germans 1941-4.

Belgrade to-day. B. is the seat of an Orthodox patriarch and a Rom. Catholic

Belgravia, fashionable residential dist. of London, N.W. of Victoria station, lying mostly within the city of Westminster. It was developed by the builder Thomas Cubitt (q.v.) on ground belonging to the 1st Marquess of Westminster (q.v.) after special powers had been obtained through an Act of Parliament of 1826. Sev. of the names of streets, etc., are derived from the family name (Grosvenor) and titles, among them the viscounty of Belgrave, of the dukes of Westminster.

Belial, compound Heb. word, meaning that which is without profit or worth. It is often treated in the Bible as a proper name, having acquired personification by usage in such phrases as 'a son of Belial,' and, 'What concord hath Christ with Belial?' In the N.T. the changed form of Beliar is due to Syrian pronunciation. In Apocalyptic literature B. = Satan.

Belief, mental attitude towards a statement which entails willingness to

assert that the statement is true and (on the side of behaviour) to act as if it were true. Most of the puzzles about B. arise from conflict between these verbal and behavioural criteria of B. A man may, for example, sincerely assert his B. in another world while behaving as if there were no other world than the present one. We are then inclined in ordinary speech to say: 'He doesn't really believe it.' See D. Hume, *A Treatise of Human Nature* (Bk I, *Of the Understanding*), 1739; James Mill, *Analysis of the Phenomena of the Human Mind*, 1829; A. Bain, *The Emotions and the Will*, 1859; W. James, *The Will to Believe*, 1931.

Beligrad, see BERAT.

Belinskiy, Vissarion Grigor'yevich (1811-1848), famous Russian literary critic, one of the leaders of the Westernisers (q.v.) and the first representative of the non-noble radical intelligentsia (see INTELLIGENTSIA). He founded the sociological school of literary criticism which was dominant in Russia until the end of the cent. and has been revived by the Communists. See his *Selected Philosophical Works*, Moscow, 1948, and the study by H. E. Bowman, 1954.

Belisarius (c. 505-65), Byzantine soldier, b. probably in Germania, in Illyria. He is first mentioned about 525, during the war between the Byzantine empire and Persia. About this time Procopius, from whose hist. the events of the life of B. are gathered, became his secretary. In 530 B. was commander of the E. imperial army, and brilliantly defeated a large Persian force at Dara, in N. Mesopotamia. In the next year the Persians invaded Syria, and B. was defeated at Callinicum on the Euphrates. He was recalled to Constantinople, where he married Antonia, a wealthy woman who was a friend of the Empress Theodora. In 533 he was sent into Africa to recover the imperial provs. held there by Gelimer, King of the Vandals. He landed in Sept. at Caput Vada, and advanced to Decimum, where he gained a victory. He then entered Carthage. The king was finally captured at Mt Pappua, and B. returned to Constantinople, where he was honoured with a triumph. In 535 he was made sole consul. Later in that year he set out to recover Italy from the Goths. In 536 he took Naples and occupied Lower Italy, and at the end of the year entered Rome by amicable arrangement with the Gothic garrison. During 537 he was besieged there by Vitiges, the Gothic king, the siege being abandoned early in 538, when Vitiges retired to Ravenna. In 540 B. captured Ravenna, and took Vitiges prisoner, but was recalled by Justinian before completing his conquests. During 541-2 he was engaged in a campaign against the Persians, but in 544 the Ostrogoths, under Totila, again invaded Italy, and B. was sent by Justinian to lead the expedition against them. He regained possession of Rome, but on the whole this It. campaign was unsuccessful, and after 5 years he was recalled to Constantinople, where he stayed in retirement till 559. In that year he defeated the

Bulgarians, who were threatening Constantinople. In 563 he was imprisoned on a charge of conspiracy against Justinian, but his innocence was soon estab., and he was released after 6 months. See study, *Count Belisarius*, by Robert Grant, 1938.

Belitoeng, or **Belitung**, see BILLITON.

Belize (Belice), cap. of Brit. Honduras and of B. dist., on the Bay of Honduras, at the mouth of the R. B. or Rio Viejo. The riv. divides the tn into 2 parts. The harbour is shallow and impaired by sand-bars, so that large vessels must load and unload by means of lighters; small vessels enter by a channel through the reefs. Logwood, mahogany, and chicle gum are exported. Half the tn was destroyed by a hurricane on 10 Sept. 1931. It has been gradually rebuilt. B. is connected with other tns in Honduras by means of telephone and telegraph lines. Air services connect with Jamaica, Havana, Miami, Guatemala, El Salvador, Nicaragua, and Costa Rica from Stanley airfield 10 m. W. Pop. 21,880. The ter. is claimed by Guatemala.

Belknap, Sir Robert, jurist, chief justice of the court of common pleas from 1374 to 1388, when he was removed for having, unwillingly, signed an affirmative to the question of Edward III, 'Whether I might by my regal power revoke that which was acted in parliament.' In the succeeding Parliament all the judges were arrested in Westminster Hall on a charge of high treason, but B. escaped with his life through the intercession of the bishops (*Fuller's Worthies of England*.)

Bell, Alexander Graham (1847-1922), inventor, b. Edinburgh; educ. at the Edinburgh High School and Edinburgh and London univs. Going with his father, Alexander Melville B., to Canada in 1870, he became prof. of vocal physiology at Boston Univ. in 1872, where his experiments resulted in the patenting of the telephone in 1876. He also invented the photophone and graphophone, and wrote many papers on electrical matters and work in connection with deaf-mutes.

Bell, Alexander Melville (1819-1905), Scottish-Amer. educationist, b. Edinburgh, Scotland. He devised the system of 'visible speech,' by which deaf-mutes are taught to speak.

Bell, Andrew (1753-1832), educationist, b. St Andrews, Scotland; educ. at the univ. there. After acting as tutor to the family of a Virginian planter he returned to England, where he took orders and sailed for India to become a chaplain. In 1789 he became superintendent of the Madras Male Orphan Asylum, founded by the E. India Co. for the education of the sons of military men. The grave shortage of efficient teachers led him to think that the work might be done by the pupils themselves. Clever boys were placed in charge of small groups for the purpose of learning to write the alphabet. B. thought the system could be extended, and on his return to England pub. (1797) *An Experiment in Education made at the Male Asylum of Madras*. His subsequent writings merely expanded views

expressed in this pamphlet. Joseph Lancaster (q.v.) put forward a similar scheme in 1803 and founded a school. The two men know each other and were at first on friendly terms. The issue which divided them and their followers was whether the Church should control the education of children. B. advocated a national system through the existing organisation of the Church and under the control of parochial clergy. To this end the National Society for Promoting the Education of the Poor was estab. B. became its superintendent and by the end of his life there were 12,000 Society schools. He did not wish the poor to be educ. too much, however, and although many of his methods were enlightened and he wished to do away with corporal punishment his achievements were probably less than his friends supposed. His monitorial system certainly reduced the cost of teaching but failed as a complete system of education. Out of it grew the pupil-teacher system of training introduced in 1846. Denominational controversy of the kind engaged in by B. continued to dog educational development. B. d. at Cheltenham and was buried with great ceremony in Westminster Abbey.

Bell, Sir Charles (1774-1842), surgeon and neurologist, b. Edinburgh, where he studied anatomy and surgery under his brother John (q.v.). In 1804 he moved to London, where he taught anatomy and in 1811 took over the famous Windmill Street School founded by John and Wm Hunter. He was appointed surgeon to the Middlesex Hospital, 1814, and raised that institution to the highest repute. He was called to the chair of surgery at Edinburgh in 1836 and remained there until his death. B.'s anatomical work was the most important in Britain during the early part of the 19th cent. His *System of Dissections*, 1799-1801, with its exquisite drawings by his own hand, was pub. while he was still a student; his *Idea of a New Anatomy of the Brain*, 1811, was the first of his works discovering the anatomy and functions of the spinal nerves. In 1807-9 he pub. his *System of Operative Surgery*. In 1821 his *Illustrations of the Great Operations of Surgery*; in 1830 he first described facial palsy ('Bell's palsy'), and in 1833 appeared his Bridgewater treatise on *The Hand: its Mechanism and Design*. Many of his discoveries in the physiology of the nervous system were described in his *Nervous System of the Human Body*, 1830. B. attended the wounded after Corunna and Waterloo. He was a genial, unaffected man, with a captivating twinkle behind his eye-glasses, a bit of a dandy in his attire. He was knighted in 1829. See A. Pichot, *Life and Labour of Sir Charles Bell*, 1860.

Bell, Sir Charles (1870-1945), civil servant and traveller, b. Douglas, Isle of Man; educ. Winchester and New College, Oxford; joined the Indian Civil Service, 1891. B. is best remembered as a great champion of Tibetan independence and the author of sev. important works on

Tibet. He was present at the Tibet Conference (1913-14); conducted a diplomatic mission (1920) to Lhasa, where he stayed 11 months; was knighted in 1922. In 1934 and 1935 he travelled in Tibet, Mongolia, Manchuria, and Siberia; and in 1937 was awarded the Lawrence Memorial Medal by the Royal Central Asian Society. His writings include *Tibet: Past and Present*, 1924, *The People of Tibet*, 1928, *The Religion of Tibet*, 1941, and *Portrait of the Dalai Lama*, 1946. See also his *English-Tibetan Colloquial Dictionary* (2nd ed.), 1920.

Bell, Charles Frederic Moberly (1847-1911), Eng. journalist, b. Alexandria, and educ. in England. In 1880 he was one of the founders of the *Egyptian Gazette*. He became famous as a *Times* correspondent during the Arabi revolt of 1882. In 1890 he returned to England as manager of *The Times*, in succession to J. C. McDonald. His enterprises included *The Times Atlas*, 1895, the *History of the South African War*, 1900-9, and *The Times Book Club*, 1905. In 1908 he became managing director of the reconstructed Times Publishing Co. See F. H. Kitchin, *Moberly Bell and his Times*, 1925; E. C. H. Moberly Bell, *The Life and Letters of C. F. Moberly Bell*, 1927.

Bell, Clive (1881-), art and literary critic; educ. Marlborough and Cambridge. His *Since Cézanne*, 1922, and *Landmarks in Nineteenth-century Painting* are contributions to the comparative study of French and other schools of painting. Other works: *Art*, 1914; *Poems*, 1921; *Civilisation*, 1928; *Proust*, 1929; *An Account of French Painting*, 1931; *Enjoying Pictures*, 1934; *The French Impressionists*, 1954. He became chevalier of the Legion of Honour in 1936.

Bell, Currer, Ellis, and Acton, see BRONTË.

Bell, Gertrude Margaret Lowthian (1868-1926), traveller and archaeologist, b. Washington Hall, Durham, daughter of Sir Hugh B., ironmaster and colliery owner. Educ. at Queen's College, London, and Lady Margaret Hall, Oxford. She learnt Persian with the view of joining her relative, Sir Frank Lascelles, ambas. in Persia, in Teheran, whither she went in 1892. At Teheran she acquired a knowledge of the E. by taking a desert journey in 1900 to Jerusalem and Syria. Later she took lessons in Arabic and Persian from 2 sheikhs at Haifa. A polyglot by nature, she learned enough Hindustani to find her way about India without an interpreter. In 1905 she continued her Persian studies under Reinach in Paris, and afterwards made her name with *The Desert and the Sown*, pub. in 1907, and *The Thousand and One Churches*, a description of ruins and inscriptions of churches in Lycæonia written in collaboration with Sir Wm Ramsay. A few years later saw her once more in the E., first in Damascus and then in Bagdad, where she was destined to take a leading part in the administrative development of the new Arab state, Iraq, during its most critical years under the high commissionership of Sir Percy Cox. The knowledge she had

acquired of the Arab tribes proved of value during the First World War, and from 1915 she was interpreter of all reports received from central Arabia. Later, in Cairo, she assisted Col. Lawrence (Lawrence of Arabia) by doing propaganda work for dealing with the revolt in the desert. At Basra she prepared political memoranda and performed staff work under Sir Percy Cox, later being made assistant political officer at Baghdad. She received the C.B.E. in 1917, and attended the Peace Conference in Paris in 1919. Later in that year she returned to Baghdad, where she was thenceforth known as the Mother of the Faithful, the last woman who bore the name being Ayesha, the wife of the Prophet. In 1926 she completed the arrangement of the Bagdad museum of which she was honorary director of antiquities, and was preparing to return home to England when she died peacefully in her sleep. She was buried with military honours in the cemetery outside Baghdad. Other publs.: *Safar Nameh or Persian Pictures*, 1894; *Poems from the Divan of Hafiz*, 1897; *Amurath to Amurath*, 1907; *Palace and Mosque at Ukhaiddir*, 1914; *Review of the Civil Administration of Mesopotamia*, 1921. *The Letters of Gertrude Bell*, 1927, were ed. by her step-mother, Lady B.

Bell, Henry (1767-1830), marine engineer, one of the originators of steam navigation, b. Torphichen Mill, Linlithgow. Served in a shipbuilding yard at Bo'ness, with an engineering firm in London, and in 1790 he settled in Glasgow, but removed in 1807 to Helensburgh, where he studied mechanics. In 1812 the *Comet*, a small vessel 40 ft long, built under his direction and with an engine constructed by himself, was launched on the Clyde, being one of the first steam vessels in Europe. See SHIPS AND SHIP-BUILDING.

Bell, John (1691-1780), Scottish traveller, commonly called B. of Antermomy, who followed the medical profession. In 1714 he went to St Petersburg, where he joined an embassy to Persia. He returned to St Petersburg, where he was appointed to another embassy, this time to Peking; and returned to Moscow, 1722. Of these travels he wrote a most entertaining account. He returned to Scotland c. 1725. He undertook in 1737 another mission for Russia to Constantinople, where he settled as a merchant. He married, 1746, and retired to Antermomy. His travels were printed and pub. at Glasgow, 1763.

Bell, John (1745-1831). Brit. publisher. Defying the combination of some 40 London publishers who joined in bringing out Johnson's ed. of the poets, B. pub. *The British Poets* in his own ed. of over 100 vols., including the chief poets from Chaucer to Churchill with the exception of a few that were copyright. B. was the first publisher to discard the long s (f) from his fount of type. He was one of the founders of the *Morning Post* and was proprietor of a Sunday newspaper, *Bell's Weekly Messenger*, and of the sporting paper *Bell's Life in London*.

Bell, John (1763-1820), anatomist and surgeon, b. Edinburgh, educ. at the High School there. Opened, 1790, a private school of anatomy; 1793, pub. his *Anatomy*; next *Discourse on the Nature and Cure of Wounds*, 1795; *Principles of Surgery*, 1801-8. He is regarded as the founder of surgical anatomy. He d. at Rome.

Bell, John (1811-95), sculptor, b. Hopton, Suffolk. Statues by him of Lord Falkland and Sir Robert Walpole were commissioned for the Houses of Parliament. The memorial to the guards who fell in the Crimea is also by B.

Bell, Joseph (1837-1911), surgeon, b. Edinburgh. He was surgeon to the Royal Infirmary and Royal Hospital for Sick Children, Edinburgh (1864), lecturer on clinical surgery (1879), and editor of the *Edinburgh Medical Journal*, 1873-96. His publs. are *Manual of Surgical Operations* and *Notes on Surgery for Nurses*. He was the prototype of Sir A. Conan Doyle's celebrated detective, Sherlock Holmes.

Bell, Robert (1800-67), journalist, b. Cork. He was educ. at Trinity College, Dublin, where with others he founded the Dublin Historical Society. In 1828 he became editor of the *Atlas* in London. The best-known of his works are *Lives of the English Poets* (2 vols.), 1839, and an annotated ed. of Eng. poets (24 vols.), 1854-7.

Bell, Robert (1811-1917), Canadian geologist, b. Toronto. He made topographical and geological surveys in nearly all parts of Canada; was medical officer, naturalist, and geologist to the *Neptune, Albert*, and *Diana* expeditions, 1884-97, and surveyed many rivers and lakes of the dominion. He pub. upwards of 200 reports and papers—mostly on geological, biological, and geographical subjects—together with folklore.

Bell, Robert Anning (1863-1933), artist and designer, b. London, and educ. at Univ. College School. His illustrations for books are notable, as also his stained-glass designs. He designed the mosaic panels in the Houses of Parliament and in Westminster Cathedral. A.R.A., 1914; R.A., 1922.

Bell, Robert Charles (1806-72), engraver, b. Edinburgh. His largest work was an engraving of 'The Battle of Prestonpans,' after Sir Wm Allan. Between the years 1850 and 1872 a number of his best plates appeared in the *Art Journal*.

Bell, hollow, metallic, percussion instrument, in shape resembling a reversed cup, suspended by its apex, or 'crown.' It may be sounded by striking with a hammer, or suspending a clapper within it, and either pulling the clapper against it, or swinging the B., when the clapper will be caused to strike the B. by its own movement.

Bell-founding. B.s are made of a kind of bronze, known as B.-metal (q.v.). In early times, B.s were not cast, but were made of thin plates of hammered iron, riveted together. The B. called *Clog-an-cadhacha Phatraic* (the B. of Patrick's

will) at Belfast, mentioned in the *Annals of Ulster* as early as AD 552, is quadrangular in shape and of this primitive type, as are also some of the Scottish B.s. The small B.s discovered by Layard in the palace of Nimrod, on the site of the ancient city of Nineveh, are made of copper and tin, in the proportion of 10-1. During the Middle Ages, the quantity of tin used was increased, to harden the alloy and provide B.s of greater vibrance. In modern times the approximate ratio is 4-1 (see BELL-METAL). It was formerly thought that a mixture of silver with B-metal sweetened the tone, but it has been proved that silver in any quantity is injurious to the tone of a B., great or small. B.s have also been made of antimony, brass, steel, gold, and thick glass. B.s cast of steel have a fair tone but a less sustained vibration, and give a higher note than a B. of similar size and weight in B-metal. The casting of B.s in England was originally practised in monasteries. It was then adopted as a trade by itinerant artificers.

The art of casting in England has undergone many changes since the Middle Ages. Then, B.s were cast much as they are on the continent to-day, the process being as follows: after the initial design was prepared, 2 moulding boards were made, one a template of the inside shape, the other a template of the outside. The boards were bolted to a central pivot so that they could be revolved by hand, and a core mould was then made of brick work covered with clay, using the board for the inside mould as a guide to smooth off the clay. This was dried and with the outer shape board a replica of the B. was struck up on the core, in clay, and all decorative work applied to it in wax. This in turn was covered with a thick coating of clay strengthened with iron bands to withstand the pressure of the molten metal which it was later to hold. This was then dried, during which time the wax melted leaving its impression in the clay. The outer clay mould, or 'cope' was lifted off and the clay 'false' B. chipped away. The 2 moulds were then finally dressed and clamped together and the B-metal run into the space previously occupied by the 'false' B. To-day, in place of the moulding boards, a template of the actual section of the B. is used and the two moulds made from it independently. The core is struck up on a brick foundation as before, while the 'cope' mould is prepared by striking up the clay inside a perforated iron moulding case. Apart from moulding technique, advances have been made in the tuning of B.s, particularly in the control of the partial or harmonic tones, of which the prin. are: (1) Hum-note (the deepest). (2) Fundamental note (an octave above the hum-note). (3) The minor third interval above the fundamental. (4) The fifth interval above the fundamental. (5) The nominal or octave above the fundamental. These at least must be correct to produce a good B. and others are sometimes brought under control. The tuning is done after casting by turning the B.s on a boring machine and cutting the metal away from the inside.

While modern B. castings as such are no better than those produced 400 years ago, tonally B.s produced to-day are far superior. The following are recognised to be fair proportions for a B.: the thickness of the edge to be between one-tenth and one-fifteenth of the diameter, and the height just over three-quarters of the diameter.

History of bells. Hand-B.s or cymbals were employed by the Egyptians at the festival of Isis. Aaron and the Heb. high priests wore golden B.s, alternating with pomegranate knobs on the blue robe of the ephod. The Greeks used B.s in their camps; and the Romans employed them to announce the hour of bathing, and as a signal to begin selling in the market-place. The introduction of B.-ringing into the Christian Church has been ascribed to Paulinus, Bishop of Nola in Campania (AD 353-431), probably because *nola* and *campana* are late Lat. words for B.; but the date of their introduction is a cent. later. They were introduced into Gaul about AD 500. In the 7th cent., Bede mentions a B. brought by Benedict from Italy for his abbey at Wearmouth, and says B.s were used at Whitby Abbey at the time of the death of St Hilda, 680. Pope Sabinianus ordained the ringing of B.s to announce canonical hours in 604. It appears that B.s were not used in Switzerland and Germany for religious purposes till the 11th cent. For a long time B.s were comparatively small, and were often only hand-B.s. The *Clog-un-eadhachta Phutraic*, already mentioned, is 6 in. high, 4 in. deep, and 5 in. broad. Larger B.s began to be cast in the 18th cent. The largest B. in the world is the *Tsar Kolokol* of Moscow, which was cast in 1733. It is 20 ft 7 in. in height, 22 ft 8 in. in diameter, and weighs 432,000 lb. In 1737, owing to a fire, it was cracked while still in its casting pit, by water played on it. In 1837 it was raised after much trouble, and placed on an octagonal pedestal of granite. It is believed that the interior was used as a chapel for a time, the piece that came out when it cracked providing the door. Among other large B.s are the *Amarapoora*, in Burma, 260,000 lb.; those at Roten and Vienna, each about 40,000 lb.; Montreal Cathedral, 28,560 lb.; 'Big Ben' of the Houses of Parliament, 30,000 lb.; Great Paul of St Paul's Cathedral, 37,500 lb.; and Great George of Liverpool Cathedral, 33,100 lb. The B.s of Liverpool Cathedral are the heaviest in the world rung for change ringing. Great Tom of Oxford, which was originally a pre-reformation B. at Osney Abbey, was recast in its present form in 1680; weighing 14,000 lb., it was then the largest B. in England. Another B. of interest is the Liberty B. which proclaimed the U.S. Declaration of Independence on 4 July 1776. The original was cast at the Whitechapel Foundry but broke soon after it was hung; it was recast in Philadelphia, and was cracked again when being tolled for the death of Chief Justice Marshall. A Festival B. weighing 2352 lb. was cast for the 1951 S. Bank Exhibition, the process being televised

from the foundry; it now hangs at Kelvedon, Essex.

The uses of bells. B.s have been chiefly associated with ceremonies of a sacred character. In the Anglican and Rom. churches they are consecrated, have sponsors, are sprinkled with water, anointed, and receive names. Inscriptions on old B.s are of interest, and show that superstitious ideas prevailed as to the power of B.s over evil spirits, in dispelling storms, and putting an end to famine, pestilence, etc. The *Passing B.* was rung in order to terrify evil spirits from the dying body, as well as to admonish the living. By the 18th cent. tolling took place after death. The *Sanctus* or *Sacring B.* was rung during the celebration of mass. The *Pardon B.*, of pre-Reformation date, was tolled before or after service to call men to pray for the forgiveness of their personal sins. Other B.s, connected with religious services, are the *Gabriel* or *Ave B.*, the *Vesper B.*, and the *Wedding* or *Marriage B.* B.s were also employed for secular purposes. They were used as a call to arms, as a warning of danger, particularly of flood and fire, and by watchmen at night. The *Curfew B.*, supposed to have been introduced by William the Conqueror, was rung at eight o'clock as a warning to men that it was time to extinguish their lights and go to rest. It was abolished by Henry I in 1100. B.s were, and still are, attached to cows and sheep (usually only to the leader of the herd or flock), as a signal to the shepherd. These B.s or crotals are also attached to the front horse of a sleighing team in N. Europe, Russia, and N. America. The hanging of B.s, with wire connections, in houses was adopted during the 18th cent., but has been replaced by the electric B.

The ringing of B.s so as to admit changes was at one time a fashionable art, for the *School of Recreations or Gentleman's Tutor* (1684) has a chapter on 'Advice to a Ringer.' The first known work on the subject is *Tintinnologia*, pub. by Fabian Stedman in 1668. The muffled peal is effected by covering half the clapper with a cap of leather. The art of pealing B.s has been carried to great perfection in England. See also CAMPANOLOGY; CARILLON; CHIMES. See T. North, *English Bells and Bell Lore*, 1888; A. S. Pease, *Notes on the Uses of Bells among the Greeks and Romans*, 1904; J. J. Raven, *Bells of England*, 1906; E. Morris, *The History and Art of Change Ringing*, 1931; F. P. Price, *The Carillon*, 1933; H. B. Walters, *Church Bells*, 1937.

Bell, Book, and Candle, popular phrase used to describe solemn ceremonial excommunication as practised in the Church of Rome. The officiating ecclesiastic, after pronouncing his malediction, closes his book, throws a lighted candle to the ground, and tolls the bell as for the dead. The symbolic significance of the first 2 actions is that the anathematised person is removed from the book of life, and his soul is cast from the sight of God as the candle from the sight of men. See ANATHEMA.

Bell-bird, name given to sev. birds on account of their notes, but applied in particular to the Brazilian campanero, a species of Cotingidae. It is a white, frugivorous bird, and is noted for a long black fleshy appendage dotted with feathers which hang from its forehead. When the bird utters its cry this caruncle becomes elongated.

Bell-casting, see BELL.

Bell-flower, name applied to different species of Campanula (q.v.).

Bell Island, in Conception Bay, near the S.E. extremity of Newfoundland. It is about 6 m. long by 3 m. broad. The soil is fertile, and there are rich deposits of hematite iron ore (estimated at 3,500,000,000 tons). The cliffs are rocky and imposing, some standing 400 ft high. The main tn is Wabana (pop. 7837).

Bell-metal, an alloy, composed of a mixture of copper and tin, used for making bells. There is from 18 per cent to 30 per cent tin, with 80 per cent to 70 per cent copper, the proportion of tin being larger in the case of small bells.

Bell Pepper, see GUINEA PEPPER.

Bell Rock, or **Inchcape Rock**, reef off the E. coast of Scotland, at the opening of the bay formed by the Red Head in Angus and Fife Ness, nearly opposite the mouth of the Tay. It is nearly 12 m. S.E. of Arbroath, and is about 2000 ft long. A lighthouse, 120 ft high, designed by Robert Stevenson and Rennie, was erected in 1807-11; a new light-room was built in 1902. The old tradition of the bell hung on a tree by the abbot of Aberbrothock (Arbroath) is celebrated in Southey's ballad, *The Inchcape Rock*.

Bella, Stefano della (1610-64). It. etcher, b. Florence. He was influenced by Callot, worked in France for Cardinal Richelieu, is noted for a graceful, mannered style. His etchings, which reached a high standard, probably number about 15,000.

Bella, It. tn, in Basilicata (q.v.), 16 m. NW. of Potenza (q.v.). Pop. 4000.

Bellac, Fr. tn, cap. of an arron., in the dept of Haute-Vienne. It is a picturesque tn, on a hill overlooking the valley of the Vienne. There are leather industries. Pop. 4300.

Belladonna, see ATROPA.

Belladonna Lily (*Amaryllis B.*), family Amaryllidaceae, the single species of its genus; native of Cape Prov. It is devoid of a corona, and is zygomorphic, in which it differs from its allies, the daffodil and snowdrop.

Bellagio, It. tn, in Lombardy (q.v.), beautifully situated on the promontory dividing the 2 arms of Lake Como (q.v.). It is a popular resort. Pop. (tn) 1400; (com.) 3000.

Bellamy, Edward (1850-98), Amer. social reformer and author, b. Chicopee Falls, Massachusetts. He studied in New York and Germany. He attracted attention by *Looking Backward, 2000-1887*, in which book he pictured life under socialistic conditions. In 1897 *Equality*, sequel to *Looking Backward*, was pub.

Bellamy, George Anne (c. 1727-88), actress, illegitimate daughter of Lord

Tyrawley; educ. at a Fr. convent. She lived with her mother in London, and associated with Mrs Woffington and Garrick. She became a famous actress, and, till 1770, played in London, Edinburgh, and Dublin. Her extravagance and licence, which were as renowned as her career was brilliant, caused her sorrow and poverty in her later years. Released from the debtors' prison in 1785, she pub. her *Apology*.

• **Bellamy, Jacobus** (1757-86), Dutch poet, b. Flushing of poor parents. His first verses, *Gezangen mijner jeugd*, 1782, and *Vaderlandsche Gezangen van Zeelandus*, 1782-3, expressed his love for his native country. Aided by wealthy admirers, he went to Utrecht, with the intention of studying divinity. These studies, however, he soon left for the pursuits of literature. He gained great popularity, especially with his verse romance *Toosje*, 1874. See J. A. Nijland, *Leven en Werken van J. Bellamy* (2 vols.), 1918.

Bellarmino, Robert (Roberto Francesco Romolo Bellarmino), St (1542-1621), It. prelate, b. Tuscany. He entered the Society of Jesus in 1560; was ordained priest at Ghent by Jansenius in 1569, and appointed prof. of theology at the univ. of Louvain the year after; having filled this chair for 7 years he went to Rome in 1576; created cardinal, 1599; Archbishop of Capua, 1611-5. He then became chief theological adviser to the Pope. A model of Christian asceticism, and one of the greatest theological controversialists of the Rom. Church. Canonised 1930; declared a doctor of the Church 1931. Among his most important works are his *Disputationes de Controversiis Christianae Fidei* (3 vols.), 1581, 1582, 1583, *De Potestate Summi Pontificis*, and *De Scripturis Ecclesiasticis*. See J. Brodrick, *The Life and Work of Blessed Robert Bellarmine* (2 vols.), 1928.

Bellary, tn of Mysore State, India. The tn is 300 m. from Madras by rail, and was formerly a military station. The fort, built on a bare granite rock, rises abruptly from the plain to the height of 450 ft. A high point opposite it is called the Copper Mt.; Hyder Ali is said to have worked it, but found the expense exceeded the profit.

Bellasis, Edward (1800-73), Eng. serjeant-at-law. He was educ. at Christ's Hospital, and was called to the Bar in 1824. He became serjeant-at-law in 1844. From 1833 to 1845 he was interested in the Oxford Movement, and became acquainted intimately with Newman, Pusey, Ward, and Manning. He left an interesting autobiography and a number of theological treatises, besides taking a prominent part in the controversy aroused by the bull of Pius IX in 1850, in which year he became a Rom. Catholic.

Bellatrix (γ Orionis), white star of the second magnitude in the shoulder of Orion, and W. of Betelgeuse (q.v.).

Bellay, Joachim du (1525-60), Fr. poet, b. Liré, near Angers, of a noble and powerful family. He studied law and humanities at the Collège de Coqueret with Ronsard, Baif, and others. In 1549 he pub. his *Défence et illustration de la langue*

françoise, the manifesto of the Pléiade poets, advocating the use of French, but made a worthy vehicle of expression by modelling it on Greek and Latin. In the same year appeared a series of love sonnets, *L'Olive*, which, however, are too Petrarchan in inspiration. From 1553 to 1557 he was in Rome as secretary to his cousin, the ambas. Jean du B. On his return he pub. his *Antiquités de Rome*, and *Les Regrets*, the latter his best and most characteristic work, a collection of sonnets expressing his longing for France and his native Anjou, and satirising the corruption of modern Rome. His poems reveal a melancholy mind which muses on the flight of time and the passing of human greatness, a melancholy increased by his growing deafness. His poetry, like Ronsard's, is the spontaneous expression of a lyrical genius, but Du B. is perhaps the more sincere poet, and might, had he lived longer, have surpassed his friend. His other works include *Divers jeux rustiques*, 1558, *Le poète courtois*, 1559, and 4 books of Lat. poems. See A. Chamard, *Joachim du Bellay*, 1900, and J. Vianey, *Les 'Regrets' de Du Bellay*, 1930.

Belle Alliance, name of a farm, the centre of the position of Napoleon's army at the battle of Waterloo. It lies 13 m. S. of Brussels. Wellington and Blücher met here. The battle of Waterloo is known as that of B. A. by the Germans.

Belle-Ile-en-Mer, is. of France, dept of Morbihan, in the Atlantic Ocean, 8 m. S. of Quiberon Point. Its length is nearly 12 m. and its greatest breadth about 7 m. The chief industry is pilchard and sardine fishing; fine draught-horses are reared, and the soil is fertile and well cultivated. Adm. Hawke defeated the Fr. fleet under Conflans off the coast in 1759; the is. was captured by the English in 1761, but restored to France 2 years later. The chief tn is Le Palais. Pop. 2200.

Belle-Isle, Charles Louis Auguste Fouquet (1684-1761), Fr. marshal, a grandson of the intendant Fouquet, b. Villefranche. After distinguishing himself in the wars of the Sp. Succession, he was made governor of Metz and a marshal of France. He, with Broglie, had command of the forces in the war of the Austrian Succession, and stormed Prague in 1741. In the year following he led the brilliant retreat to Eger. He became minister of war in 1758.

Belle Isle, is. in the Atlantic, lying between Newfoundland and Labrador, about 15 m. from either coast. Area about 15 sq. m. There is a lighthouse, 470 ft high, visible at a distance of 28 m.

Belle Isle, Strait of, channel between Newfoundland and Labrador, forming an entrance to the Gulf of St Lawrence from the Atlantic Ocean; it is the main route from Great Britain to the St Lawrence R., but during the winter months it is blocked with ice. It is about 80 m. in length, the breadth varying from 10 to 18 m.

Belleau, Rémy (c. 1628-77), Fr. poet, member of the Pléiade, b. Nogent-le-Rotrou. He was tutor to Charles, Marquis d'Elbeuf, who, under B.'s tuition, became a noted patron of the muses. He

produced the first Fr. trans. of Anacreon and achieved celebrity by his *Amours et nouveaux échanges des pierres précieuses*, 1576, describing the properties of precious gems. His chief work, however, is *La Bergerie*, 1565, a prose and verse pastoral in imitation of Sannazaro. His *Avril* is a stock item in Fr. anthologies. See D. Dolacourle, *Le sentiment de l'art dans la "Bergerie"*, 1945.

Belleau Wood, forest to the NW. of Château-Thierry in France. At Château-Thierry Amer. troops took a large share in preventing the Germans from advancing across the Marne towards Paris in May-June 1918. As a continuation and part of that battle came the intense fighting in B. W., where the offensive was undertaken by the 2nd Div. of the Amer. Expeditionary Force. This was largely made up of the U.S.A. Marines and of regiments from the regular U.S.A. Army. After nearly 3 weeks of intensive fighting, in which their losses were severe, the Americans cleared the Germans and their machine-gun nests out of the forest, and not only held it, but also the little tn of Vaux.

Belleek, vil. of co. Fermanagh, N. Ireland, on the Donagall border, which gives its name to the B. china made there. Pop. included in rural dist. of Irvinestown (q.v.).

Bellegarde: 1. Fortress, situated on a peak, 1380 ft above the sea, in the dept of Pyrénées-Orientales, France, on the Sp. border, 17 m. S. of Perpignan. Philip III of France (q.v.) was defeated in the neighbourhood by Peter III of Aragon (1285). The fortress was captured by the Spaniards in 1793, but was retaken, 1794.

2. Fr. tn in the dept of Ain, at the confluence of the Rhône and the Valserine. The Génissiat dam near by, part of a hydro-electric scheme, is one of the largest in Europe. Pop. 5400.

Bellême, Robert, Earl of Shrewsbury, fl. 1098. Anglo-Norman noble, knighted by William the Conqueror in 1073. During Rufus's reign he became the most powerful lord in the realm and became Earl of Shrewsbury in 1098. He rebelled against Henry I, and in 1102 he lost his Eng. estates and returned to Normandy. He d. in prison, to which he had been committed by Henry I.

Bellême, or Bellesme, Fr. tn in the dept of Orne. It has a market. To the N. is the small forest of B. where there are some mineral springs. Pop. 1700.

Bellenden, John (c. 1533-c. 1587), translator, educ. at St Andrews and Paris. His *Chroniklis of Scotland*, 1536, is a free trans. of the *Historia Gentis Scotorum* of Roesce (q.v.), and is the earliest existing specimen of Scottish literary prose; B. also trans. the first 5 books of Livy. He enjoyed the royal favour, and became archdeacon of Moray.

Bellenden, Sir John (d. 1577), courtier, eldest son of Sir Thomas B. of Auchinvoile. In 1547 he was made a lord of session by the queen regent. In 1551 Mary Queen of Scots appointed him one of her privy council, and he was believed to be implicated in the murder of the queen's favour-

ite, Rizzio; he fled from Edinburgh, but was soon restored to favour, and supported the queen's marriage with Bothwell.

Bellenden, William, Scottish classical scholar, and writer on Cicero, who fl. in the early part of the 17th cent. He held a chair at the univ. of Paris, and was favoured by James I of England.

Bellerophon, son of Glaucus, King of Corinth, and Eurymede (Homer, *Iliad*, vi). His name was changed to B. from Hipponous, after having killed Bellerus by accident. He was sent for ritual purification to Proetus, King of Argos, and unwittingly won the love of Antea, his wife. He spurned her advances, whereupon she sought to turn her husband against him. Proetus sent him to Iobates, King of Lycia, with sealed instructions to put B. to death. Iobates, unwilling to kill him directly, imposed upon him the impossible task of killing the monster Chimaera. But by the aid of Pallas, who gave him the winged horse Pegasus, he succeeded. He defeated the Amazons, and cut down the Lycian ambuscade, which Iobates had set to kill him. Thereupon the king gave him his daughter Philonoe in marriage. See Wm Morris, *The Earthly Paradise*.

Belles-lettres, term borrowed by the English and other languages from the French, signifying any writing of a refined or elegant character, but more particularly applied to essays, poetry, and criticism.

Belleville: 1. E. dist. of Paris, formerly a vil.

2. Tn of Essex co., New Jersey, U.S.A., 3½ m. NE. of Newark. It manufs. leather, machinery, tools, electrical equipment, chemicals, and food products. Pop. 32,019.

3. City and co. seat of St Clair co., Illinois, U.S.A., railway centre near E. St Louis. It manufs. stoves; clay, metal, and enamel products; clothing, chemicals, etc.; coal-mines and clay and sand deposits are found near by. Pop. 32,700.

4. Tn in Ontario, Canada, on the Bay of Quinte and the Moira R. The Albert Univ. was founded here in 1857. Pop. 20,658.

Bellevue, Fr. tn in the dept of Seine-et-Oise, part of the com. of Meudon (q.v.). It grew up around a château, now destroyed, built by Madame de Pompadour (q.v.). Pop. 5000.

Bellew, Harold Kyrle (1857-1911), actor, b. Prescot, Lancs; entered the navy, and later went to Australia, where he first appeared on the stage in 1874. In 1878 he joined Henry Irving's company at the Lyceum, and in 1879 Marie Litton's at the Imperial. Later he formed a touring company with Mrs Brown-Potter. The partnership broke up in 1898, when he appeared successively at the Criterion and Lyceum.

Belley, Fr. tn, cap. of an arron., in the dept of Ain. It was the ant. cap. of Bugey (q.v.), and is a bishopric. Brillat-Savarin (q.v.) was b. here. There are leather and printing industries. Pop. 5300.

Belli, Giuseppe Gioachino (1791-1863), It. satirical poet, b. at Rome. Most of his poetry is written in the Rom. dialect, and is directed against Rom. society. See *I sonnetti romaneschi* (6 vols.), 1886-9, ed. by Morandi.

Belligerents, Rights and Duties of. The conduct of war involves the relations first between the 2 parties engaged in the war, the B., and secondly between either or both of those parties and neutrals. (See NEUTRALITY and CONTRABAND.) By the Articles of the Hague Convention, 1907, the armed forces of the B. must alone carry on the war, and to them alone do the rights, duties, and laws of war apply; besides the regular army, militia, or volunteer forces, may be regarded as belligerent troops, and not as mere marauders, only if they are commanded by someone responsible for his men's acts, carry emblems distinctive and recognisable at a distance, carry arms openly, and conduct war in accordance with accepted laws and customs. The last 2 conditions will suffice when the pop. of an invaded country take up arms and have not time to organise under the other conditions. Enemy property on land, where it belongs to the state, can be seized by an army of occupation; also all appliances for transmission of news, persons, or goods and munitions of war belonging to private persons can be seized, but must be returned with compensation after peace. Private property on land is not immune in war. Enemy private property on sea is also liable to capture and confiscation. It is forbidden to use poison or poisoned arms; to kill or wound persons belonging to the enemy nation or forces treacherously, or those who have surrendered at discretion; to declare 'no quarter' shall be given; to use arms or projectiles, etc., which will cause superfluous injury; to use flags of truce, enemy's flags or uniforms, or red-cross badges improperly; to bombard undefended places or dwellings, except on a refusal after formal summons to furnish supplies; to destroy and seize property except when urgently necessary for purposes of war; or to pillage a tn or place, even if taken by assault.

Prisoners of war must be treated humanely; they are in the power of the enemy's gov., not of those that took them; they may be confined, but only as a measure of necessity; they may be authorised to work, but not for any purpose of the war; they are treated on the same footing as the soldiers of their captors in respect of food, etc. Escaped prisoners are subject to punishment if caught before rejoining their own army or before leaving the country occupied by their captors; if captured a second time after escaping successfully, they are not liable to punishment for first escape. A prisoner released on parole and recaptured bearing arms forfeits his rights as a prisoner of war. For treatment of sick and wounded in war see GENEVA CONVENTION; it may be noted that the Hague Convention, 1907, drew up rules on the lines of the Geneva Convention for the conduct of hospital ships and the treatment of sick and

wounded in naval warfare. Although the great powers had been formulating international law for the half cent. before the First World War no opportunity had occurred for testing the various agreements reached, and finding out by actual experience their working value. One feature of the First World War was the invention and use of new weapons (e.g. tanks), yet no international agreement was reaching adapting the use of them to the general principles of international law already estab. The blockade of Germany caused Great Britain to declare by proclamation that she attached enemy character to companies, wherever incorporated, carrying on business in enemy country. Direct trading with the enemy was forbidden, but this did not prevent indirect trading via neutrals, and in order to stop this the 'Trading with the Enemy (Extension of Powers) Act, 1915' prohibited persons resident in U.K. from trading with persons in neutral countries likely to have association with the enemy. Internment of enemy subjects was dealt with variously in practice. Great Britain, France, Italy, and U.S.A. gave enemy subjects a certain time to leave their ter., but Germany and Austria detained all enemy subjects at the outset, but later released those not of military age. Enemy subjects allowed to remain in belligerent states were also treated variously; in Great Britain, France, and Germany they were interned; in the U.S.A. they had a fair measure of freedom, and in Japan no restrictions were imposed. The Hague Conference in 1907 agreed that merchant ships in enemy ports should be given some days' grace to clear from those ports, but Article 6 provided that the convention should only be applicable to a war in which all the B. were parties to it. Neither Italy, Serbia, nor U.S.A. came within this category. Germany offered days of grace to Great Britain, who replied with a counter-offer, to which no reply was received. The term 'merchant ships' in the convention was also debated. Great Britain held that it did not apply to tugs and lighters used in a port or to pleasure yachts, but Germany adopted the opposite view. The distinction between armed forces and the civil pop. is now disappearing owing to (a) the organised employment of a nation's manpower, (b) the employment of aircraft for bombing civilians as well as troops, (c) the inability of democratic govts. to conduct war without the active support of the electorate they represent, (d) the importance of conducting an economic war. Under the Washington Treaty, 1922, Great Britain, France, Italy, Japan, and U.S.A. agreed not to use any kind of gas, but this treaty is no longer operative. It was hoped, through the League of Nations, to postpone recourse to war in disputes between nations by the procedure under the Covenant of the League. Under the Covenant (q.v.) the members of the League agreed 'that if there should arise between us any dispute likely to lead to a rupture, we will submit the matter either to arbitration or to inquiry by the Council, and . . . in no case resort to

arms until 3 months after an award has been made by the arbitrators or a report has been made by the Council.' This procedure was intended to delay the opening of hostilities, and permit of the dispute being considered by a third party. But the arbitrary action of the 'totalitarian' powers, as illustrated by the Jap. invasion of China, the It. invasion of Abyssinia, and the Ger. seizure of Austria and Czechoslovakia, went far to destroy this hope even before the outbreak of the world war in 1939. The events of the war weakened the validity of much international law in so far as it concerned the rights of B. Nevertheless, the Hague Convention retained an authority on which could be based much of the prosecution of the war criminals at the trials conducted at Nuremberg in 1946. Even the defence had recourse to them. For instance, according to the evidence of Kottel (former chief of staff of the Ger. Army), Hitler gave Himmler plenary powers as Reichsführer of the S.S. so as to enable it to become a factor in the direction of the war against Russia by the side of the *Wehrmacht* on the 'legal thesis' that the Soviet Gov. had not ratified either the Hague rule of land warfare or the Geneva Convention (q.v.), and had thus knowingly and willingly exempted themselves from the rules of international law.

Bellincioni, Gemma (1864-1950), It. soprano singer, b. Como. She is remembered particularly for her interpretations of Santuzza in *Cavalleria rusticana*, of Violetta in *La Traviata*, and of Salome in Strauss's opera. She began by playing light and comic parts. Tamberlik, the tenor, noticing her ability, engaged her to tour with him abroad. Also established herself as an actress in stage plays, the *Dame aux Camélias* being one of her most marked successes. Pub. *Io ed il Palcoscenico* (Myself and the Stage), Milan, 1920.

Bellingham: 1. Markt tn of Northumberland, England, on the l. b. of the R. Tyne. The church dates from the 11th cent. and has a roof of hexagonal stone ribs overlaid with slabs of stone which is believed to be unique. Near by is the site of the battle of Otterburn (q.v.). Pop. 1300.

2. City of Whatcom co., Washington, U.S.A., on B. Bay, 80 m. N. of Seattle; an important shipping centre. Prin. industries: saw-milling, salmon canning; manufs. tin cans and machinery. Pop. 34,112.

3. Dist. in the E. of the bor. of Lewisham, London, with a large L.C.C. housing estate.

Bellingshausen, Fabian Gottlieb von (1778-1852), Russian naval officer and explorer, b. Oesel Is., Livonia. Entered Russian Navy in 1797. In 1803 he circumnavigated the world, and, later, led a Russian expedition to the Antarctic, reaching as far S. as 70° S. lat. He was present at the battle of Varna, 1828.

Bellingshausen Sea, portion of the Antarctic Ocean, SW. of Drake Strait and W. of Graham Land. It is named after the Russian explorer (q.v.).

Bellini, Gentile (c. 1429-1507), It. painter, eldest son of Jacopo B., b. Venice. He was trained by his father and was much employed in Venice on scenes from the city's history. His love of ceremonial scenes appears in his 'Procession in the Piazza San Marco' (Accademia, Venice). In 1469 he was made Count Palatine by the Emperor. Some of B.'s pictures were taken to Constantinople, and Mohammed II invited the artist to his court. He was courteously received by the sultan, who sat to him for his portrait, and commissioned him to paint various historical works. Among them was the 'Decoliation of St John'; this picture was admired by Mohammed, who pointed out some inaccuracy in the marking of the dis severed neck; and, in order to prove the justice of his criticism, he ordered the head of a slave to be struck off in the presence of the artist. From this moment B. never enjoyed an hour's tranquillity until he had obtained leave to return to Venice. Mohammed, whose portrait he painted (National Gallery), dismissed him with marks of favour, placing a gold chain round his neck and giving him letters to the Venetian senate expressive of his satisfaction. He was engaged in various public works after his return to Venice, for which he was requited by the rep. with an honourable pension for life and the order of St Mark. His 'St Mark preaching at Alexandria' (now in the Brera Gallery, Milan) was left to be finished by his brother Giovanni (q.v.).



Anderson

GIOVANNI BELLINI

Self-portrait in the Uffizi Gallery, Florence.

Bellini, Giovanni (c. 1422-1516), It. painter, the son of Jacopo and the brother of Gentile B., b. Venice. He contributed perhaps more than any painter

of his time to the creation of the great Venetian school. From Mantegna (q.v.) he acquired firm design (as in the National Gallery 'Agony in the Garden') and from Antonello da Messina (q.v.) richness in colour. He ornamented the public edifices and churches of Venice and other cities of Italy with a prodigious number of paintings, had many pupils and followers, and continued his labours to a very advanced age. Some of his small pictures are in England; but it is only by his large works in Italy that a full idea of his power can be formed. See G. Gronau, *Klassiker der Kunst, Bellini*, 1930.

Bellini, Jacopo (c. 1400-70), It. painter, b. Venice, was one of the earliest artists in oil painting, and his works had considerable merit and influence. He painted portraits and frescoes. A few of his works survive, but his manner is best judged from the book of his sketches, which is in the Brit. Museum. He is better known as the father of Gentile and Giovanni B. (q.v.), and the father-in-law of Mantegna (q.v.).

Bellini, Laurentio (1643-1703), It. physician, b. Florence. After receiving in his native place the elements of a classical education, he proceeded to Pisa, where he made such progress in his studies that, when only 20 years of age, he was appointed prof. of philosophy and of theoretical medicine. He taught anatomy and practised medicine at Pisa, with great success, for 30 years, when he was invited to Florence and made chief physician to the Grand Duke Cosmo III. His best work is the treatise *Gustus organum novissime deprehensum* (Bologna, 1665), in which he pointed out the papillae of the tongue to be the essential organs of taste. He discovered and described the straight tubules of the kidney named after him (*De structura et usu renum*, Florence, 1662). His works were collected and pub. in 2 vols. (Venice, 1708, reprinted 1732).

Bellini, Vincenzo (1801-35), It. operatic composer, b. Catania, Sicily, and descended from a family of musicians. Entered the Neapolitan conservatoire, studying under Zingarelli. Wrote a cantata and some masses. His first opera, *Adelson e Salvini*, was performed in 1824 at an obscure theatre in Naples, but his second, *Bianca e Gerardo*, produced in 1826 at the San Carlo, Naples, made his name. The following year he wrote *Il Pirata* for the Scala of Milan; and this was succeeded by *La Straniera*, at the same theatre. The more familiar of B.'s operas are *I Capuletti ed i Montecchi*, 1829, based on *Romeo and Juliet*, in which the part of Romeo became a favourite of the great contraltos of 6 or more decades; *La Sonambula*, 1831, *Norma*, his best and most serious work, 1831, and *I Puritani*, written for the It. opera in Paris in 1835 and influenced to some extent by Fr. music. He received a commission to write a work for the Paris Opéra, but while studying Fr. verse and prosody for this work he was seized with a sudden and fatal illness. He wrote flowing melody, and gave the voice every opportunity to reveal its natural charm and its acquired technique. His

popularity soon after his death was enormous.

Bellinzona, cap. of the canton of Ticino, Switzerland, 8 m. ENE. of the head of Lago Maggiore, commanding the St Gotthard route. B. played a considerable part in the early cents. AD, being a key to sev. Alpine passes. It has 3 old castles, and railway repair shops. Pop. 12,600, Italian-speaking.

Bellis, family Compositae, genus of ann. to perennial herbs, 15 species. *B. perennis* is the Daisy (q.v.), a native weed of grassland, but with sev. cultivated garden forms.

Bellmann, Carl Michael (1740-95), Swedish poet, b. Stockholm. He studied at the univ. of Upsala. At first a civil servant, he was enabled to devote himself entirely to literature by the liberality of Gustavus III, who appointed him to a nominal office, with the title of secretary of the court. His first literary efforts were religious poems. But his reputation rests on his lyrics, which he himself set to music, especially *Fredmans Epistlar* and *Fredmans Sångar*, written between 1768 and 1774. His poems give a vivid picture of Stockholm, often peopled by rogues and drunkards. His realism is combined with humour and a supreme technical skill. B. is one of the few Swedish poets of universal importance. See H. W. Van Loon and G. Castagnetta, *C. M. Bellman, the last of the Troubadours*, 1939; A. Stålhane, *En Bellmans bok*, 1947; C. Elling, *Bellmaniana*, 1947; A. Blanck, *C. M. Bellman*, 1948.

Bello, Francesco (c. 1450-1505), It. epic poet, known as Cieco da Ferrara on account of his blindness. Lived in great poverty at Mantua and Ferrara. His *Il Mambriano* (45 cantos), dealing with the romantic and chivalrous adventures of an oriental potentate, had a considerable influence on Ariosto's *Orlando Furioso*.

Belloc, Joseph Hilaire Pierre (1870-1953), poet, essayist, and historian, b. La Celle, Saint-Cloud, son of Louis Swanton Belloc, advocate. He was, as a Rom. Catholic, educ. at the Oratory School, Edgbaston, under Newman, and afterwards served for a year as a driver in the Fr. artillery. After a brilliant career at Oxford, where he took first-class honours in hist., and was President of the Union, he became a naturalised Brit. subject in 1902. In 1906 he was elected M.P. for S. Salford as a Liberal. Becoming disillusioned with Eng. politics, he retired from Parliament, 1910; and, in conjunction with Cecil Chesterton, estab. in 1911 the *Eye-Witness*—afterwards the *New Witness*. His numerous writings range from political pamphleteering to works of serious historical study, and although his reputation may be said to be mainly that of a historian, his name is also estab. as a poet and essayist. In addition, he wrote some 16 novels, nearly all of which were illustrated by G. K. Chesterton. As an essayist he has an engaging style, and the easy variety of his choice of subject is shown in *Hills and the Sea*, 1906, *On Nothing*, 1908, *On Everything*, 1909, *On Something*, 1911, *This and That and the*

Other, 1913. Sev. other vols. of essays followed, among which may be mentioned *Essays of a Catholic Layman in England*, 1931. His historical and biographical works were written from the point of view of a Catholic controversialist, and he looked at Eng. hist. in particular with the eye of a continental writer. His major historical works are *History of England, 1688-1910* (vol. xi of Lingard's *History*), 1914, *The Last Days of the French Monarchy*, 1916, *Europe and the Faith*, 1920, *The Campaign of 1812 and the Retreat from Moscow*, 1924, *A History of England* (4 vols.), 1925-31; *Six British Battles*, 1931, *The Tactics and Strategy of the Great Duke of Marlborough*, 1933, *A Shorter History of England*, 1934, and *Monarchy: a Study of Louis XIV.*, 1938. B.'s biographical writings include studies and lives of Danton, 1899, Robespierre, 1901, Marie Antoinette, 1909, James II, 1928, Joan of Arc, 1929, Richelieu, 1929, Wolsey, 1930, Cranmer, 1931, Napoleon, 1932, Charles I, 1933, William the Conqueror, 1933, Cromwell, 1934, and Milton, 1935. He also wrote a number of books which sprang from his enthusiasm for travel and his love of places. They include *The Historic Thames*, 1907, *The Stane Street*, 1913, and *The Cruise of the 'Nona'*, 1925; and the same spirit animates many of his essays, while the best known of his books, *The Path to Rome*, 1902, is the story of a journey by road from the N. of France through Switzerland to Rome. Among his writings on contemporary politics, *The Party System*, 1911, with Cecil Chesterton, and *The Servile State*, 1912, should be mentioned, and in a lighter vein *But Soft—we are observed!*, 1928. His first financial success was in the different field of books for children with *The Bad Child's Book of Beasts*, 1896, followed by *More Beasts for Worse Children*, 1897, *Cautionary Tales for Children*, 1908, and *New Cautionary Tales*, 1930. B. also ranks high as a poet of both serious and light verse, and pub. 4 vols. of verse between 1896 and 1923, also *The Chanty of Nona*, 1928, and *Ladies and Gentlemen*, 1932. His latest works were *The Great Heresies*, 1938, and *The Last Rally*, 1940. The official biography is by Robert Speaight, 1957; see also a study by J. B. Morton, 1955.

Belloc Lowndes, Marie Adelaide (1868-1947), novelist; only daughter of Louis Belloc and sister of Hilaire Belloc. Educ. at Mayfield convent, Sussex, she married, 1896, Frederick Sawrey Lowndes. Her novel, *The Heart of Penelope*, was pub. in 1904, and after that she estab. her reputation as a teller of stories with exciting incident combined with psychological interest. Among the best known are *Barbara Rebell*, 1905, and *The Lodger*, 1913, the latter being trans. into a number of foreign languages. Her play, *With All John's Love*, was produced in 1932, and was followed by 2 others. She was also the author of 3 vols. of memoirs, *I too have lived in Arcadia*, 1941, *Where Love and Friendship dwell*, 1943, and *The Merry Wives of Westminster*, 1946.

Bellona, the Rom. goddess of war, sister

or wife of Mars. During the Samnite war (296 BC) Appius Claudius vowed a temple to her, afterwards erected (293 BC) in the Campus Martius.

Bellet, Joseph René (1826-53), Fr. naval officer and Arctic explorer, b. Paris. He won the cross of the Legion of Honour in the Fr. expedition against Tamatave in 1845. In 1851 he joined the party in search of Sir John Franklin under Wm Kennedy. In Mar. 1853 he was drowned while on the expedition under Capt. Inglefield. An obelisk at Greenwich commemorates him. His memoirs and jour. were pub. in English in 1855. See *Polar Record*, No. 39, 1950.

Bellet Strait, sea channel between N. Somerset Is. and Boothia Felix, N. Canada; discovered by Joseph Bellet.

Bellows, Albert F. (1829-83), Amer. landscape painter, b. Milford, Massachusetts, studied and painted in France, Belgium, and England. His early work was in oils, but later he turned to water-colour. Among his works are 'Afternoon in Surrey', 1868, and 'Sunday in Devonshire', 1876.

Bellows, see BLOWING-MACHINE.

Bellows-fish, see CENTRISCUS.

Bellou, Dormont de (real name Pierre Laurent Buirette) (1727-75), Fr. dramatist and actor, b. Saint-Flour in Auvergne. He was intended for the legal profession, but he preferred the stage. He played principally at St Petersburg. His tragedy, *Tibris*, which was introduced in France in 1758, was a failure, and thus disappointed B. returned to Russia. His next play, *Zelmire*, in 1762, and *Le Siège de Calais*, in 1765, were successful when produced in Paris. He was mainly responsible for the innovation of having Frenchmen as heroes of plays, rather than figures from classical hist. and legend.

Bells, nautical term, used in describing the time. See WATCH.

Bells, Electric, see ELECTRIC BELLS AND ALARMS.

Bellshill and Mossend, tn of Lanarkshire, Scotland, 4 m. NE. of Hamilton. At Mossend are extensive steelworks. Combined pop. 21,500.

Belluno, Duke of, see VICTOR, PERRIN CLAUDE, DUKE OF BELLUNO.

Belluno: 1. Prov. of Italy, in N. Veneto (q.v.). It is in the Alps (q.v.), and is bounded by Austria on the N. In the W. are peaks of the Dolomites (q.v.). There are many steep valleys of the Piave and its triba. The prin. tn. include Belluno and Feltre (qq.v.). Area 1450 sq. m. Pop. 242,000.

2. (Anct. Bellunum), It. tn, cap. of the prov. of Belluno, on a spur above the Piave, 48 m. N. of Venice (q.v.). It has a 16th-cent. Palladian cathedral, the façade of which is still unfinished. There are silk and wax industries, and a trade in agric. produce, timber, and fruit. Pop. 29,000.

Bellunum, see BELLUNO.

Belmez, Sp. tn in the prov. of Córdoba, in a coal-mining dist. Pop. 12,000.

Belo Horizonte, cap. of the state of Minas Geraes, Brazil; formerly (before 1897) called Curral del Rey. The neighbourhood produces gold, manganese, and

iron, coffee, grapes, malze, etc. It has a univ., textile mills, and the metal industry is well represented. It was the scene of fighting in the Civil war of 1930. Bp. of President Kubitschek. Pop. 346,200.

Beloit, city of Wisconsin, U.S.A., on the Rock R. at the Illinois state line, in dairying area. It manufs. paper-making and woodworking machinery, Diesel engines, and agric. implements. It is the seat of B. College and the L. Wright Art Hall. Pop. 29,600.

Belon, Pierre, Fr. botanist, b. in a par. of the Fr. prov. of Maine c. 1517. Nothing is known concerning his family. Medicine and botany were his studies at a very early period of his life. He visited Germany, Bohemia, Italy, Greece, Egypt, Palestine, and Asia Minor, and appeared in Paris, after 3 years of absence, in 1550, with an extensive collection, which he arranged, and from which he proceeded to pub. various works. In 1557 he traversed Italy, Savoy, Dauphiné, and Auvergne. In 1564 he was murdered in the Bois du Boulogne as he was returning to Paris.

Belorussia, or White Russia (Belorussian *Belarus'*), constituent rep. of the U.S.S.R., situated in the W. of the country, adjacent to the Polish border. It lies in the W. part of the Russian plain and is traversed from SW. to NE. by the Belorussian moraine upland with lowlands in the N. and NW. (W. Dvina and Niemen valleys) and in the S. (the Dnieper and Pripyet lowland, *see* POLES'YE). B. has a moderate humid continental climate. About one-quarter of the area is covered by mixed forests, about 10 per cent by marshes. B. has large peat deposits, but little else of mineral resources. Area 80,100 sq. m.; pop. (1956) 8,000,000, mostly Belorussians (four-fifths of total pop.) and Russians (since 16th cent.), before the Second World War also many Jews and Poles (both since 14th cent.). There are engineering, wood-processing, food, and light industries, coarse grain, potato, and flax growing, dairy farming, and hog raising. The prin. tns are Minsk (cap.), Gomel', Vitebsk, Mogil'ev. B. is divided into 7 administrative Oblasts: Brest, Gomel', Grodno, Minsk, Mogil'ev, Molodechno, and Vitebsk. In the 9th cent. AD the whole area of B. was inhabited by the Russian (E. Slav) tribes Krivichi, Dregovich, Polochane, Radimichi, and Buzhane, all of whom fell under the sway of Kiev (*see* KIEVAN RUSSIA). An early local centre of authority developed in Polotsk (q.v.). The weakening of Kiev in the 12th cent. resulted in the emergence of the new principalities of Turov-Pinsk, Smolensk, and Volhynia (q.v.). In the 13th-14th cents. all these were incorporated into the Grand Duchy of Lithuania. In the Polish partitions of 1772-95 all B. was annexed by Russia, but in 1920-39 W. B. once again belonged to Poland. In both world wars B. was the scene of bitter fighting and suffered greatly. In the 19th cent. B. was affected by the Polish uprisings of 1830 and 1863, in which not only the Polish or Polonised gentry but also a

section of the Belorussian peasantry took part. Later the Populist (*see* POPULISM), the Social Democratic (*see* BUND), and the Zionist (*see* ZIONISM) movements were strong in B. From the beginning of the 20th cent. demands for the territorial autonomy of B. began to be voiced by the Belorussian Revolutionary (later Socialist) Hromada, which failed, however, to attract much support. The Bolshevik seizure of power in 1917 was followed by a struggle between Bolshevik, Ukrainian, Polish, and Belorussian organisations and units of the Russian W. Front, by Ger. occupation in 1918 under which an independent Belorussian rep. was



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proclaimed, and by the Polish occupation in 1920 marked by Jewish pogroms. After an attempt in 1919 to set up a united Lithuanian-Belorussian Soviet rep. the Communists estab. In 1921 a small Belorussian rep., which in 1922 became a constituent rep. of the U.S.S.R. Its area was increased 1924-6 by the inclusion of the neighbouring parts to the E., and in 1939 by the inclusion of W. B. During the Nazi occupation 1941-4 B., together with the Baltic States, belonged to the Reich Commissariat 'Ostland.' As in many other national reps. of the U.S.S.R. in the 1920's, the power in B. was largely concentrated in the hands of National Communists (*see* NATIONAL COMMUNISM). They were eliminated when Stalin estab. his supremacy in Russia, but accusations of nationalist deviations in B. have continued. *See* R. Pipes, *The Formation of the Soviet Union*, Cambridge, Massachusetts, 1954, and W. Kolarz, *Russia and Her Colonies*, 1952.

Belorussians, or White Russians, E. Slav people closely related to the Russians

(Great Russians) and Ukrainians, live in Belorussia and the surrounding area. B. developed a separate identity in the 13th-14th cents. when the whole area belonged to the Grand Duchy of Lithuania. The Russian element greatly outnumbered the Lithuanians and was culturally superior, and Belorussian was the official language of the Grand Duchy until its union with Poland in 1569. The ensuing advance of Catholicism and the Polishising influences were resisted by the Orthodox Church and the *bratstvos* (see BRATSTVO), and the majority of B. remained Russian and Orthodox. They did not, however, develop a national consciousness of their own until the late 19th to early 20th cent., when a Belorussian literature and press appeared.

Belostok, see BIALYSTOK.

Below, Fritz von (1853-1918), Ger. general. He first saw service in the Franco-Ger. war of 1870-1. In 1912 he was appointed to the command of the 21st Army Corps, and at the beginning of the First World War his corps formed part of the Ger. Sixth Army on the W. front. In 1915, however, his corps was transferred to the E. front, where it played a distinguished part against the Russians. He was appointed to the command of the First Army in 1916 and was opposed to the British on the Somme in Nov. of that year. He *d.* in a field hospital on the W. front.

Below, Otto von (1857-1944), Ger. general. On outbreak of the First World War he was commanding an infantry div. in E. Prussia. At the battle of Narva he commanded the 1st Reserve Corps against the Russians. In the Masurian winter battle of Feb. 1915 he commanded the Eighth Army, which played a distinguished part in the capture of Lyck. In the summer of 1915 he became commander of the Army of the Niemen. In Oct. 1916 he was sent to the Macedonian front to take command of the operations in that theatre. In 1917 he commanded a mixed Ger.-Austrian force in Italy, which defeated the Italians at the battle of Caporetto, a defeat which would have had more serious results for the Entente had B. not advanced too far ahead of his transport. In the Ger. offensive of Mar. 1918 B. was in command of the Seventeenth Army during the battle of the Somme. After the armistice B. commanded a force in E. Prussia, and retired in 1919.

Belpasso, tn of Sicily (q.v.), in the prov. of Catania in the E. of the is., 7½ m. NW. of Catania. B. lies on the S. slope of Mt Etna (q.v.): since its destruction by a lava stream in 1669 it has twice been rebuilt. It is chiefly engaged in fruit-growing and viticulture. Pop. 9500.

Belper, mkt tn on the Derwent, 7½ m. from Derby in Derbyshire, England. It is noted for its cotton mills and hosiery factories. Pop. 15,700.

Belsen, site of a Ger. concentration camp, 10 m. NW. of Celle, Hanover. Allied troops stormed their way into it in mid-April, 1945. In it all the horrors of Buchenwald (q.v.) were found repeated.

There were at one time 10,000 persons in the camp. These included some political prisoners. Sev. Brit. Red Cross relief teams went to the camp on 22 April to tend the sick and starving prisoners, many of whom *d.* after liberation as a result of the treatment they had received from the Germans. It was ascertained that 17,000 people were cremated by the Germans in Mar., before the increasing number of deaths began to 'get out of hand.' Some internees and corpses bore the obvious marks of torture. Josef Kramer, aged 38, the camp commandant, and 29 others were tried by a military court held at Lüneburg, and of these 11, including Kramer, were, on 17 Nov. 1945, sentenced to death for the torture, whipping, and shooting of prisoners, and for selecting victims for death by the gas-chamber.

Belshazzar, Babylonian *Bel-sharru-usur* ('Bel has protected the kingship'); GK, 'Belthazar,' eldest son of Nabonidus, the last king of the Chaldean dynasty. Contemporary documents show that B. was co-regent from c. 555 BC during his father's absence in Arabia. B. perished at the fall of Babylon in 539 BC, an event following the great feast of B. described in Dan. v, which has been a favourite subject for poets and other artists. See R. P. Dougherty, *Nabonidus and Belshazzar*, 1929. See also BABYLONIA.

Belsk, see BIELSK.

Belt Case, libel suit brought by Richard Claude Belt, a sculptor, against a former pupil, Sir Charles Bennet Lawes (afterwards Lawes-Wittowronge). Lawes had accused Belt, in *Vanity Fair* and elsewhere, of acknowledging as his own certain pieces of sculpture which had been executed or finished by other persons. The case, *Belt v. Lawes*, was heard at Westminster before Baron Huddleston, and lasted 43 days, from 21 June till 28 Dec. 1882. The jury decided in Belt's favour, with £5000 damages.

Beilane, or **Beiltein** (Gaelic *bealltainn*, *bealltinn*), name applied to a Celtic festival, formerly celebrated in Ireland, Scotland, and Cornwall, traces of which still remain in different parts of the Brit. Isles. It was originally a May Day festival, when bonfires were lighted on the hill-tops, sheep were driven through fire, and, possibly, human sacrifices were made. The name is still used in the Gaelic parts of Scotland for May Day. The popular etymology of the word from Celtic *tienc*, fire, and *Bel*, the Phœnician god of the O.T., is no longer accepted.

Beltrami, Eugenio (1835-1900), It. mathematician, b. Cremona. B. lectured on mathematical physics at the univ. of Rome, and was elected president of the Lincei. His chief contribution to mathematical science resulted from his researches on the so-called non-Euclidean geometry. The formula known as Beltrami's theorem is: 'The centre of a circle circumscribing a triangle is the centre of gravity of the centres of its inscribed and escribed circles.' His most important essays are *Saggio di interpretazione della geometria non-euclidea* and

Teoria fondamentale degli spazii di curvatura costante.

Beltrami, Giulio Cesare (1779-1855), It. traveller, b. Bergamo. He was connected with the Carbonari (q.v.) societies, and in consequence was obliged to leave Italy for America in 1821. He accompanied Maj. Long on an expedition in 1823, and in the following year he discovered the sources of the R. Mississippi. He pub. a hist. of his journey at New Orleans, *La Découverte des sources du Mississippi*, 1824.

Belts and Ropes. Power may be transmitted from a main driving shaft in a factory or machine shop to subsidiary shafts by leather belts or ropes passing over pulleys on the two shafts. If an endless belt stretched from one pulley to another is open, the two pulleys rotate in the same sense; if crossed between the pulleys, the shafts rotate in opposite sense. If there is no slipping of the belt on the pulleys, the velocity of the belt equals that of the surface of either pulley, and the ratio of the angular velocities, or rev./min., of the two pulleys is the inverse of the ratio of their diameters. If the driving shaft runs at a constant speed, and it is required to increase or diminish the speed of the driven shaft, speed cones are used. These consist of pulleys of different diameters placed side by side on each shaft, so arranged that a smaller pulley on one shaft is directly opposite a larger pulley on the other, so that the length of belting passing round the pair remains constant. The speed of the driven shaft can thus be altered without tightening or loosening the belt. Belts may be used to drive pulleys which are at right angles to the driving shaft, in which case the belt takes a quarter twist. When 2 pulley shafts are not parallel, whether their directions intersect or not, the belt may be passed round and kept in place by guide-pulleys. The only condition to be observed is that the point at which the belt leaves each pulley must be in the same plane as the next pulley.

Materials. Belts are usually made of leather tanned by oak-bark; the thickness varies from $\frac{3}{8}$ to $\frac{1}{2}$ in. in single belting and twice that amount in double belting. The strength of single belting is from 750 to 1500 lb. per sq. in. of width. Rawhide is sometimes used, and is of considerable strength. The strips of leather are joined by paring down the ends, cementing them together with glue, and lacing or riveting them. It is usual to leave one joint uncemented, so that the belt may be tightened when required. Cotton belting is cheaper and stronger than leather, 8-ply cotton belting being twice as strong as double leather belting. Indiarubber is sometimes used in wet places, where leather is unsuitable, but is easily damaged by contact with oil. Chain belting consists of links of leather strung together on wire pins which are not bent as the belt passes over the pulley. Ropes are made of hemp or cotton, wire cables usually of steel wire.

Pulleys. A belt passing round a conical pulley in motion has a tendency to creep

up to the larger end. Pulleys are therefore made with the rims slightly convex, so that the belt remains in the middle of the rim. Pulleys are sometimes cast in two halves, so that they may be fixed on a shaft without interfering with the shaft bearing. Wrought-iron pulleys are often made with split rims, which are closed up by a screwed-on piece after the pulley is on the shaft. The pulleys used for hemp or cotton ropes are provided with grooves so shaped that the ropes do not reach the bottom, but are wedged in by the sides, and so give a very effective drive. Wire cables must not be wedged in the grooves of the pulleys; the driving force is exerted by the weight of the cable hanging between the two pulleys. The rope may meet the pulley at an angle, so that the shafts need not be exactly parallel. Another advantage of rope gearing is that many ropes may be run from the same driving drum to sev. machines. See W. H. Atherton, *Conveying Machinery*, 1937, and *Mechanical World Year Book* (ann.).

Belts, Jupiter's, see JUPITER.

Belts, The, straits in Denmark, which connect the Baltic with the Cattegat. The Great Belt separates Zealand and Fyn, and is nearly 40 m. long, from 10 to 15 m. broad, with a depth of from 5 to 20 fathoms. The Little Belt divides Fyn and Slesvig. It is half as wide as the former. At Fredericia it is less than a mile wide. Navigation of the B. is difficult because of the sand-banks and small low is.

Belturbet, tn in co. Cavan, Rep. of Ireland, 10 m. NW. of Cavan, on the R. Erne, with opportunities for boating and salmon-fishing. Pop. 1300.

Beluchistan, see BALUCHISTAN.

Beluga, or the white whale (*Delphinapterus leucas*), belongs to the family of Dolphins. It is found chiefly round Greenland, but occurs in many parts of the Arctic seas, and occasionally has been seen off Scotland. Its body measures 12 to 16 ft in length, and is a creamy white colour. Its head is arched, its snout short and rounded, its teeth are few, small, and conical, and it has short flippers. Young whales are at first a bluish-grey. B.s. associate in herds.

Belur, vil. of the Hassan dist. of Mysore State, India, which contains a famous temple dating from the 12th cent., carved by the same artist as at Halebid (q.v.).

Belur-Tagh, see BOLOR-TAGH.

Belus, son of Poseidon, and father of Aegyptus and Danaus. He was the legendary founder of Babylon. The patronymic Belides is given to Aegyptus and Danaus; to Lynceus, son of Aegyptus; to Palamedes; and to the Danaides, the daughters of the Danaus.

Belvao, see BILBAO.

Belvedere (from It. *bel vedere* = fine view), in architecture, a structure erected on the top of a palace or house, open to the air on one or more sides. There are many examples in It. Renaissance palaces.

Belvedere (*Kochia scoparia*), species of Chenopodiaceae which is native to E. and

central Asia. It is cultivated in Britain as an ornamental plant on account of its leaves, which resemble those of a cypress; hence it is called the summer cypress.

Belvedere College, Dublin, secondary and preparatory school for boys, conducted by the Society of Jesus. It was founded in Hardwicke Street in 1832 and transferred to Great Denmark Street in 1841.

Belvisia (*Napoleona imperialis*), family Lecythidaceae, a S. Nigerian glabrous tree that grows to a height of 7 or 8 ft and is loaded with large, broad, bright blue, red, or white flowers. The fruit resembles a pomegranate.

Belvoir Castle, situated 4 m. S. of Bottesford in Leicestershire, England. Since the time of Henry VII it has been in the hands of the Manners family, and is now the seat of the Duke of Rutland. The present castle is a fine castellated pseudo-Gothic building built in the last cent. to replace the former castle which was destroyed by fire. During the Civil war it was a royal stronghold, whilst its hist. goes back to the days when William the Conqueror granted its site to Robert de Todeneil, who founded a priory at the foot of the isolated mound from which the castle commands so wide a prospect. Its picture gallery contains paintings by Vandyck, Murillo, Reynolds, Holbein, etc.

Bely, see BELYX.

Belyta, genus of hymenopterous insects of the family Proctotrypidae. They are cosmopolitan, and their larvae live in the bodies of insects and spiders or in their eggs. These parasites are minute, have 4 wings, and frequent sandy places.

Belyx, **Andrey** (real name **Bugayev**, **Boris Nikolayevich**) (1880-1934), Russian poet, novelist, and literary theorist, a leader of the younger Symbolists. His poems and novels (*Petersburg*, 1913-16), full of linguistic innovations and experiments, are partially obscure and difficult to read.

Belzoni, Giovanni Battista (1778-1823), It. traveller and antiquarian, b. Padua, but lived during his youth at Rome, where he intended to enter the monastic life, but in 1800 he left Italy and visited most countries in Europe. In 1803 he came to England and married; he lived by exhibitions of feats of strength. He was interested in hydraulics, and went to Egypt with a plan for irrigating that country; the jealousy of the natives frustrated his intentions. He shipped many monuments of Egyptian anc. civilisation to England, and discovered many unknown tombs along the course of the Nile. In England he pub. an account of his travels and excavations.

Bem, **Joseph** (1795-1850), Polish general, b. Turnow, Galicia. He was educ. at the univ. of Cracow, and admitted as a cadet in the corps founded by Napoleon at Warsaw. After 13 years' military service, he took part in the Polish rebellion, 1830-1. He then left for Paris, where he lived for 16 years. In 1848 he joined the Hungarians, and received command of 10,000 men. In 1849 he defeated the Austrians, driving

them and their Russian allies into Wallachia. He also expelled Puchner from the Banat and returned to Transylvania. Here he was forced to retreat before the superior forces of the Russians, and escaped to Hungary where he fought in the battle of Segesvár. He escaped to Turkey, and there embraced the Muslim faith. He was appointed to the sultan's army as Amurat Pasha.

Bemba, Bantu-speaking tribe of N. Rhodesia. Practising the slash-and-burn system of shifting cultivation, they are divided into many clan groups, in which descent is traced through the mother's line. They have a king, the *Citimukulu*. To-day they are one of the foremost providers of labour for the N. Rhodesia copper-mines. See A. I. Richards, *Land, Labour and Diet in Northern Rhodesia*, 1939. See also BANTU.

Bembex, typical genus of the hymenopterous family of insects known as Bembecinae. They are peculiar to hot climates and resemble wasps in size and colour.

Bembo, **Pietro** (1470-1547), It. historian, b. Venice, the son of a Venetian patrician; studied at Padua and Ferrara. He ed. the lt. poems of Petrarch. At Urbino he became acquainted with Giuliano de' Medici, brother to Leo X, whose secretary by Giuliano's influence, B. became. In 1530 he was commissioned by the Council of Ten to write the hist. of the Venetian rep.; he wrote this in Latin, completing it up to the year 1513. In 1530 he became a cardinal.

Bembridge Beds. Oligocene deposits, formed principally in fresh water, and consisting of the B. limestone and the overlying B. marls. The latter contain a marine bed near the base. Found in the Hants basin. Named after the type locality in the ls. of Wight.

Bemselberg, **Konrad von**, see BOYNEBURG.

Ben, first syllable in many Semitic names, meaning 'son,' literally or metaphorically; e.g. Ben-hadad is the son, or the worshipper, of Hadad, the chief god of the anc. Aramacs. Benjamin, Benhanan, Ben-layil, are other biblical examples of names compounded with B.

Ben, rarely **Been**, or **Bin**, word in Scottish Gaelic (from Gaelic *beann* and Old Celtic *benns*, *bends*, meaning 'peak,' 'conical point,' 'horn') which has been adopted to indicate the most elevated summits of mt ranges, particularly mt peaks of a pyramidal form, which stand unconnected (cp. B. Alder, B. Lomond, B. More, B. Nevis, etc.). The Brythonic (Welsh, Cornish) term *pen*, meaning 'head,' occurs in many place-names in Cornwall and Wales.

Ben, **Oil**, of, extracted from the seeds, called Ben-nuts, of a tree found in the E. Indies and Arabia, and known as the horse-radish tree (*Moringa pterygosperma*). When first exposed to intense cold the oil deposits a whitish, flaky substance and, this being removed, is unaffected by cold, on which account it is of value to watch-makers. Oil of B. is also used by painters, and by perfumers to extract the scent

from flowers. When pure it retains its sweetness.

Ben Cruachan (3689 ft), mt in Argyll, Scotland, between Lochs Awe and Etive, some 12 m. E. of Oban.

Ben Lawers (3984 ft), mt in Perthshire, Scotland, about 32 m. WNW. of Perth, on the NW. side of Loch Tay, noted for its alpine flora, and for good skiing in winter.

Ben Ledi (Gaelic *Beinn le Dai*, the hill of God), mt in Perthshire, Scotland, 4 m. WNW. of Callander, height 2873 ft.

any size in Scotland being visible. From 1883 to 1904 meteorological observations were taken at the summit from an observatory (now in ruins). The base of the mt, which in circumference measures about 30 m., is composed principally of granite and gneiss, while the upper part (the visible cliff) is formed chiefly of andesite, lavas, and agglomerate.

Ben Rhydding, Ilkley, spa in the W. Riding of Yorks, England, on the bank of the R. Wharfe, 16 m. NW. of Leeds. Pop. 2800.



A. D. S. Macpherson

BEN NEVIS

The Carn Mhor Dearg *arête* is in the middle ground; beyond is the Allt a'Mhuillin glen.

Ben Lomond (3192 ft), mt in Stirling-shire, Scotland, E. of Loch Lomond, and about 26 m. NW. of Glasgow, terminated on the N. side by a precipice of 2000 ft. There is an extensive view from the summit.

Ben Macdhui, mt in Aberdeenshire, on the border of Banffshire, Scotland, the second highest mt in Great Britain, height 4296 ft. Its summit is flat and bare.

Ben More (Great Hill), mt name recurring frequently in Scotland. Best known are (1) 3843 ft in Perthshire; (2) 3273 ft (B. M. Assynt) in Sutherland; and (3) 3169 ft on the is. of Mull.

Ben Nevis, highest mt in Brit. Isles, situated in Inverness-shire, Scotland, 4½ m. ESE. of Fort William; height 4406 ft. The NE. side has a precipice of 1500 ft. Near its summit, which consists of a large plateau, snow lies in some gullies all the year round. An extensive view is obtained therefrom, every mountain of

Ben Venue (Hill of the Caves), mt of Perthshire, Scotland, on Loch Katrine, 9 m. W. of Callander, height 2393 ft.

Ben Vorlich, Scottish mts: 1. 3224 ft high, in Perthshire, 7 m. N. of Callander; 2. 3092 ft, in Dunbartonshire, 13 m. E. by N. of Inveraray.

Ben Wyvis (3429 ft), mt of Ross and Cromarty, Scotland, some 8 m. NW. of Dingwall, usually snow-capped in winter.

Benacus, **Laous**, see **GARDA LAKE OF**.
Benalla, tn of Victoria, Australia, on Broken R., 122 m. NE. of Melbourne, centre of an agric., pastoral, and mining dist. Pop. 6030.

Benares, or now (more correctly) **Banaras**, famous tn in Uttar Pradesh state, India. B. is one of the most ancient cities in the world, and one (possibly the most sacred) of the 7 Hindu sacred cities. The others are Hardway, Ujjain, Mathura (Muttra), Ajodhya, Dwarka, and Conjeevaram (Kanchipuram) (qq.v.). Buddha

(563-483 bc) came to B. from Gaya to establish Buddhism. It was sacked by Muslims in AD 1194, and most temples were then destroyed and replaced by mosques. Practically no building now in B. dates from earlier than the time of Akbar (AD 1556-1605). It was ceded to the British in AD 1775. The city is narrow, crooked, and crowded, but the riverside presents a memorable sight. A million or more pilgrims visit the city each year and bathe in the holy water of the R. Ganges. The Panch Kosi road, which is traversed by most pilgrims, circles the city and is over 36 m. in length. Since the belief exists that whosoever dies within that circuit is transported direct to heaven, the burning-ghats on the river, where the dead are cremated, are very

between N. and S. Uist, and about 20 m. W. of Skye. It belongs to Inverness-shire. Its area is about 36 sq. m. Three-quarters of the land is taken up by farming. Pop. 924.

Benbow, John (1650-1702), Eng. vice-admiral, spent his whole life in active service at sea. In 1702, when cruising near Jamaica, he attacked a Fr. squadron. His leg was shattered by a shot, but he sat on deck to take charge of the attack. He was defeated owing to the want of support from other officers. He returned to Jamaica, where his officers were court-martialled, and he d. of his wounds on 4 Nov.

Bench-warrant, order issued by the court to enforce obedience, as in the case of delinquent jurymen, for contempt of



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BATHING GHATS ALONG THE GANGES AT BENARES

busy. The B. Hindu Univ. was founded in 1916. B. is also noted for the manuf. of brass-ware and of silks, embroidery, and brocades containing gold and silver thread.

Benavente, Sp. tn in the prov. of Zamora, on the Esla. It has a ruined castle, 2 medieval churches, and a silk spinning industry. Sir John Moore (q.v.) began his retreat to La Coruña here. Pop. 9500.

Benavente y Martínez, Jacinto (1866-1954), Sp. playwright, b. Madrid. He entered the univ. there and studied law, but devoted himself to literature. He travelled over Europe and for a time was manager of a Russian circus and an actor. In 1896 he wrote his first notable play *Gente Conocido*. In 1922 he was awarded the Nobel prize. His plays are elegant and polished comedies, satirising the aristocracy and upper middle class. Among the best known are *El Hombrecito*, 1903, *Rosas de Otoño*, 1905, *Los intereses crea dos*, 1907, and *La Malquerida*, 1913. Many of the plays have been trans. into English by J. G. Underhill (4 series), 1919-24. See W. Starkie, *Jacinto Benavente*, 1924.

Benbecula, is. of the Hebrides, lying

court. These warrants are used extensively in the U.S.A.

Benchler, see INNS OF COURT.

Benchley, Robert Charles (1889-1945), Amer. humorist and actor, b. Worcester, Massachusetts. Educ. at Harvard, he took up journalism and became dramatic critic of *Life* in 1920 and of the *New Yorker* in 1929. Next year he pub. *The Treasurer's Report*, which was later made into a skit in which B. himself appeared; later still it was filmed as the first all-talking motion picture. Among his other works are *20,000 Leagues Under the Sea*; or, *David Copperfield*, 1928, *From Bed to Worse*, 1934, *My Ten Years in a Quandary*, 1936, *Inside Benchley*, 1942, *Benchley Beside Himself*, 1943, and *One Minute, Please*, 1945.

Benckendorf, Count Alexander (1849-1917), Russian diplomat, b. Berlin, educ. in France and Germany, a Rom. Catholic. Ambas. to England, 1903. Under his auspices the Anglo-Russian Agreement was signed in 1907, completing the Triple Entente.

Bencoolen, see BENKULEN.

Benczur, Julius (1844-1920), Hungarian painter, b. Nyiregyháza. Studied under Karl Piloty in Munich, and in 1863

became director of the Academy of Budapest. His most noteworthy paintings are 'Arrest of Rákóczy in 1701,' 1869, 'Family of Louis XVI during the Assault on Versailles,' 1872, 'Bacchanti,' 1881, and various portraits.

Bend, Bando, or Balteum, see HERALDRY, *Ordinaries* (5).

Bend (dyke), see **BAND**.

Benda, Jiri (Georg) (1722-95), Czech composer, b. Stáre-Benátky, Bohemia. He was one of a noted musical family. He became musical director at Berlin in 1742 and at Gotha in 1748. From 1778 until his retirement in 1785 he visited many important musical centres. His works include church music, cantatas, chamber music, and works for the stage, among which 3 'melodramas' with spoken words accompanied by the orchestra are historically important. He d. at Köstritz, Thuringia.

Benda, Julien (1867-), Fr. critic, philosopher, and novelist, b. Paris. Almost wilfully opposed to the spirit of the age in all things, he regards dissent as a sign of degeneracy. This is revealed in his *L'Ordination*, 1913 (a story of winter in Paris); in *Marie Claire*, 1911; and also in the *Dialogues d'Eleuthère* and in his pamphlet *Le Bergsonisme*. He is an anti-Bergsonian, and hostile to the neo-vitalists for their effusiveness and mobility. His reputation rests mainly on his *Trahison des clercs* (1927), in which he inveighs against the prostitution of literacy or artistic powers to political ends. In *Belphegor* he is a stern critic of democracy. He has been well described as a 'die-hard' intellectualist. This attitude is exemplified in his novel *Les Amoraux*, 1927. His later writings include *Un Regulier dans le siècle*, 1938, *La grande épreuve des démocraties*, 1940, and a book on Kant, 1940. See Herbert Read, *Julien Benda and the New Humanism*, 1930.

Bendali, Cecil (1856-1906), Eng. Sanskritist. Prof. of Sanskrit, Univ. College, London (1885-1903) and Cambridge Univ. (1903-6). His main works are *Catalogues of Sanskrit and Pali Books*, 1893, and of *Sanskrit MSS.*, 1902, in the Brit. Museum; *Subhāṣita-samgraha*, 1903; and, with Prof. Poushin, *Bodhisattva-Chāmi*, 1905.

Bendamir, Bendemeer, Bendamur, Bundameer, properly **Band-i Amir**, dam on the Kur R. in Fars, Persia, built by Azud ud-Dawla in 10th cent.

Bendemann, Eduard (1811-89), Ger. painter, b. Berlin. His master was Friedrich Wilhelm Schadow, whose daughter he married later. In 1832 he produced his picture of the 'Captive Jews' at Berlin. In 1838 he was appointed to the professorship at the Academy of Art in Dresden. His paintings were correct and elegant, but lacking in passion and force. In 1858 he succeeded his former master, Schadow, in the directorship of the Düsseldorf Academy.

Bendery (Rumanian *Tighina*; Turkish **Bender**), tn in Bessarabia (Moldavian Rep.), on the Dniester. It is a major transportation centre, and has food industries. Pop. (1930) 32,000 (c. 1914,

60,000). B. was founded by the Genoese in the 12th cent., was a strong Turkish fortress from 1558, Russian from 1812, and Rumanian 1918-40 and 1941-4.

Bendigo, formerly **Sandhurst**, prin. gold-field city in Victoria, Australia, 100 m. NNW. of Melbourne, centre of a farming and tomato-growing area. Commonwealth ordnance and many other factories are in B., which is the seat of both Anglican and Rom. Catholic bishoprics. It has a school of mines. Suburbs include Golden Square, Long Gully, and White Hills. Pop. 30,800.

Bends, Karl Knutsson, see **CHARLES VIII** (of Sweden).

Bendsburg, see **BEDZIN**.

Bendy, heraldic term applied to a shield divided by diagonal lines (dexter to sinister) into 6 equal partitions of alternate tinctures. If the number of partitions (which must always be an even number) is more than 6, the shield is described as *B. of eight, ten*, etc. If the lines are undulating, the shield is said to be *B. wavy*.

Bendzin, see **BEDZIN**.

Benedek, Ludwig August von (1804-81), Austrian soldier, b. Ödenburg, Hungary. He joined the army in 1822. In 1846 he took part in the suppression of the Polish peasants in Galicia. In 1847 he commanded a regiment in Italy, and again received command during the Hungarian campaign of 1849. Then he returned to Italy. He repelled the Piedmontese at Solferino. In 1860 he became governor of Hungary. Six years later, 1866, he had command of the N. Austrian army in the war with Prussia. He was defeated at Sadowna, and subsequently retired.

Beneden, Pierre Joseph van (1809-94), Belgian zoologist and naturalist, was appointed head of the Louvain Natural Hist. Museum in 1831. In 1881 he was appointed president of the Academy of Sciences. Among his most notable works are *Zoologie médicale* (in collaboration with Gervais); *Ostéographie des récents vivants et fossiles*, 1868; and *La Vie animale et ses mystères*, 1863.

Benedetti, Vincent, Count (1817-1900), Fr. statesman, b. Bastia in Corsica. He entered the Foreign Office, and in 1845 he was appointed consul in Egypt, and in 1848 consul at Palermo. In 1864 he was ambas. at Berlin. He drafted a secret treaty between France and Prussia, which was made public when war broke out in 1870. For this he was criticised, and retired to Corsica. He was exonerated before he d. in Paris. He pub. *Ma Mission en Prusse*, 1871, in which he defended his actions in Germany.

Benedicite, canticle or hymn, beginning in Latin 'Benedicite omnia opera Domini,' and in English, 'O all ye works of the Lord, bless ye the Lord.' It is probably an enlargement of Ps. cxlviii. It occurs in the Gk and Lat. Bible in Dan. iii, under the title of the Song of the Three Children. It is said to have been sung by the 3 young Jews, Shadrach, Meshach, and Abednego in the burning fiery furnace. This hymn formed part of the Christian service from the time of

St Chrysostom (q.v.), and is still used in the Anglican Church, especially during Lent.

Benedict, name of 15 Popes, of whom the most outstanding were:

Benedict XIV (1740-58), Archbishop of Bologna, where he was b. in 1675, and elected to the papal chair in 1740. He was an eminent canonist and devoted to learning and literature. It was he who finally fixed the procedure for the canonisation of saints. His policy was marked by an attitude of conciliation towards all secular govs. He was lenient towards the Jansenists and friendly towards Protestants and unbelievers, though he repeated the condemnation of freemasonry. While permitting the condemnation of Voltaire's works he accepted and acknowledged gracefully the dedication to himself of the latter's *Mahomet*. He d. in May 1758.

Benedict XV (Giacomo della Chiesa) (1914-22), b. 1854, a learned occupant of the papal chair, whose diplomatic training stood him in good stead during the First World War. Trained at first for the law at the Ateneo, he abandoned a legal career and was ordained in 1878, becoming secretary to the papal embassy in Madrid in 1882. Five years later he was a member of the household of Cardinal Rampolla; then secretary of state of Leo XIII. In 1907 he was Archbishop of Bologna and in 1914 was elected Pope. His sev. attempts to bring about peace were rendered nugatory by his extreme neutrality, which delayed his protests against Ger. infractions of international law and usage until too late to be effective. But he interceded with success with the Fr. and Ger. Govs. for the exchange of prisoners of war, and, again, was instrumental in stopping the pro-Ger. propaganda of the Carlist Rom. Catholics in Spain. It was during his régime that the Brit. Gov., for the first time for cents., accredited a diplomatic representative to the Vatican and that the Fr. Gov. resumed diplomatic relations after a lapse of nearly 20 years. See POPES, LIST OF THE.

Benedict, St (c. 480-547), founder of the Benedictines (q.v.). b. Nursia in Italy. At the age of about 14 he left home, whither he had gone to study, and lived for 3 years as an anchorite in a cave near Subiaco. His fame spread, and the religious of a monastery at Vicovaro invited him to direct them. They were not, however, amenable to discipline, and B. returned to his cave. During the next years as many as 12 communities gathered in the neighbourhood, looking to B. for spiritual guidance; and he thus became, as it were, the unofficial ruler in a rep. of anchorites. Eventually, in 529, B. was driven from Subiaco by the envy of a local priest, and founded the celebrated monastery at Monte Cassino (q.v.), where he wrote his rule and died. See I. Herwegen, *St Benedict* (Eng. trans.), 1924.

Benedict, Sir Julius (1804-85), Eng. composer and conductor of Ger. origin, b. Stuttgart. He was a pupil of Hummel and Weber, conductor in Vienna, 1823-5,

and after visits to Italy and Paris settled in London as conductor and operatic composer. His best opera was *The Lily of Killarney*, produced in 1862.

Benedict Biscop (c. 628-89), monk, b. of a noble Northumbrian family. During his early life he was a courtier at the court of King Oswin. After two journeys to Rome (he later made sev. more) he became a monk at Lerins. In 669 he escorted Theodore of Tarsus to Canterbury, and was made abbot of St Peter's Monastery there. Some years later he made his third journey to Rome and returned with a vast store of books and MSS. He built and endowed with these a monastery at Wearmouth, on land given him by King Ecgfrith of Northumbria. In 682 he erected a dependent house at Jarrow. Bede (q.v.) was his pupil, and drew on B.'s vast library as sources for his writing. At B.'s death the two monasteries he had founded possessed a collection of books, relics, and objects of religious art unique in England.

Benedictines, order of monks, known also as Black Monks, to distinguish them from the white-habited monks of the Cistercian observance. They follow the rule of St Benedict (q.v.). The aim of the order is personal sanctification through the prescriptions of the rule, which lays particular stress upon the choral office, study, and work, all within the framework of obedience to the abbot or other superior. The B. were a powerful civilising influence throughout the so-called Dark Ages, and they have always been prominent in the fields of scholarship and education. They were introduced into England by St Augustine of Canterbury (q.v.) and his fellow missionaries, and by the time of the Dissolution there were some 300 flourishing houses. All the cathedral priories and most of the greatest abbeys in England were Benedictine, and 5 colleges at Oxford and Cambridge owe their origins to Benedictine foundations. A number of European univs. likewise developed from Benedictine monastic schools. To-day the Eng. congregation of the order includes 7 monasteries—the abbots of Downside, Ampleforth, Douai, Belmont, Fort Augustus, Ealing, and the priory of Worth—and 4 nunneries. Houses of other congregations are at Ramsgate, Buckfast, Prinknash, Farnborough, and Quarr. See C. Butler, *Benedictine Monachism*, 1919, and D. Knowles, *The Benedictine Order*, 1929.

Benediction (Lat. *benedictus*, to bless), the conferring of a blessing or an earnest wish for the welfare of a person or project. Among Protestant churches the term is applied to the words used by the minister in dismissing his congregation. In the Rom. Catholic Church B. is an extra-liturgical service. The sacred host is exposed in a monstrance (q.v.), and with it the celebrant blesses the congregation by making the sign of the cross. Accompanying devotions vary; only the ceremony of exposition, the 'Tantum ergo' (i.e. the last 2 verses of St Thomas Aquinas's hymn *Pange lingua*), with

versicle, response, and prayer is of universal obligation.

Benedictus (Lat. 'blessed'), song of thanksgiving uttered by Zachary at the circumcision of his son St John the Baptist (Luke i. 67-8). It commences in Latin with the words 'Benedictus Dominus Deus Israel', and is used in the Rom. Catholic Church as the canticle for the office of Lauds.

● **Benediktsson, Einar** (1864-1940). Icelandic poet, administrator, and politician. He travelled widely and often resided abroad for long periods (in London for 10 years). Many of his themes are foreign, and yet no poet is more intensely Icelandic than he. His poem on the shipyards at Newcastle is one of the noblest encomiums ever sung in praise of the Brit. Navy.

Benedix, Julius Roderick (1811-73), (Ger. author and dramatist, b. Leipzig. He was in succession tenor, journalist, lecturer, and stage manager. He was gifted with a vivid imagination which was evident in his dramatic works, and a fund of humour that was displayed in his comedies, which abound in witty dialogue and humorous intricate plot, with a continual variety of scene and incident. His *Gesammelte dramatische Werke* were pub. in 27 vols. (1846-74). He wrote also popular Ger. stories, and the novel *Bilder aus dem Schauspielerleben*, 1847.

Benefice (*Beneficium*), term first used in reference to life interests in land by the Lombards and in the laws of Charlemagne's constitutions. These lands were generally given as incentives to martial prowess. Later they became grants of a hereditary feudal nature. To-day the word refers to any variety of church dignity, and in particular those of rectories and vicarages which are B.s with the cure of souls and so differ from bishoprics and cathedral dignities. Exempt, or peculiar, B.s are those not under the jurisdiction of a bishop, though regarding residence they are under episcopal administration. The holding of a B. is dependent upon 4 conditions: the first Holy Orders; the second Presentation by the patron; the third Institution (q.v.); fourthly, Induction (q.v.).

Beneficiary, in the law of both England and Scotland, term used to denote any person who is in the enjoyment of, or is entitled to, any interest or estate held in trust by other persons. It is often doubtful in the case of charitable bequests who the B.s really are, and the courts or commissioners occasionally, as a result of their inquiries, reform the charity, and so change the class of B.s. (See *CHARITIES*.) The trustees are liable to give an account of their actions to the B.s, and an interdict or injunction may be issued against them by the latter if they make a wrongful use of their funds.

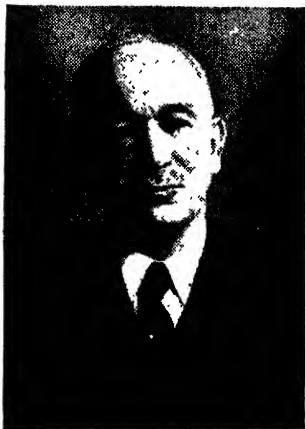
Benefit of Clergy was formerly the right of clergy accused of felony (q.v.) to be tried in the eccles. courts. The privilege was later extended to anyone who could read. From the 15th cent. this right was curtailed, and it was finally abolished in 1827. In Scotland the benefit was never recognised.

Benefit Societies, see FRIENDLY SOCIETIES.

Beneke, Friedrich Eduard, Ger. psychologist, b. Berlin, 1798. He pub. many books on metaphysics and ethics, of which the best known are *Theory of Knowledge*, 1820, and *Foundation of All Knowledge*, 1820. In 1854 he suddenly disappeared; 2 years later his body was discovered in the canal at Charlottenburg.

Benelux, customs union of Belgium, the Netherlands, and Luxembourg, an agreement for which was signed in London by the 3 govts. in exile in 1944, and ratified in 1947. It came into force in 1948, with the form of a tariff union: the same duties are imposed by all 3 countries on imports from abroad, but no import duties are levied on goods exchanged between the 3 countries. Further stages in the B. union are progressive abolition of quotas, licences, excise and consumption taxes, culminating in final economic union when goods will move within the 3 countries as easily as they do in the U.K. or U.S.A. See also BRUSSELS TREATY and CUSTOMS UNION.

Beneš, Eduard (1884-1948), Czech statesman. Of peasant stock, he was educ. at the Czech Univ. at Prague, at the Sorbonne and elsewhere in France. He became a lecturer in economics and, later, in sociology in the univ. of Prague.



Karsh, Ottawa

EDUARD BENEŠ

At the beginning of the First World War he fled from Bohemia to Paris. He then assisted T. G. Masaryk (q.v.) and Gen. Stefaunik in the foundation of the Czechoslovak National Council, and a Czech national army was brought into being. In 1919 B. was chosen with Dr Kramarž as Czech delegate to the Inter-Allied Peace Conference at Paris, and he was a signatory of the peace treaties. He

became the first foreign secretary of the newly created Czechoslovak Rep., of which Masaryk was the first president. He succeeded Masaryk as president in Dec. 1935. B. was largely instrumental in the fashioning of the Little Entente (q.v.), a pact between Czechoslovakia, Yugoslavia, and Rumania, the main object of which was to prevent any Hungarian or Hapsburg attempt to upset the settlement of 1919. An alliance with Russia was concluded during B.'s presidency. He was a persistent advocate of the principle of compulsory arbitration in international disputes. B. resigned the presidency in October 1938 as a result of the Munich Pact. He went to Chicago as a univ. lecturer, and, after the outbreak of the Second World War, came to England and took the lead in the movement for the restoration of Czech freedom in co-operation with the W. Allies. In 1940 when the Czech National Committee was recognised as a provisional gov. B. again assumed the functions of president. After the defeat of Germany B. returned to Prague in May 1945 at the head of the Second Czechoslovak Rep. Under his continued presidency the country settled down to a programme of reconstruction with a pronounced Socialist bias, which included the nationalisation of some thousand large industrial concerns. The first elections in the liberated rep. were held in May 1946: the Communists emerged as the leading party, and in July 1946 Klement Gottwald (q.v.), the Communist leader, became Prime Minister. Subsequently, in Feb. 1948, Gottwald turned Czechoslovakia into a Communist state. In June 1948 B. resigned his office as president, and was succeeded by Gottwald. See Pierre Crabites, *Benesh: Statesman of Central Europe*, 1935; also Compton Mackenzie, *Dr Benesh*, 1946.

Beneschau, see **BENEŠOV**.

Benešov (Ger. **Beneschau**), Czechoslovak tn in the region of Prague (q.v.). It has a trade in horses and agric. produce. Pop. 8300.

Benét, Stephen Vincent (1898-1943), Amer. poet and novelist, b. Bethlehem, Pennsylvania, and educ. at Yale. During his college days he wrote *Five Men and Pompey*, 1915, and *Pompey Advocate*, 1918, both in verse. His first novel, *The Beginning of Wisdom*, 1921, exploits his college experiences. The poems in *Heavens and Earth*, 1920, *King David*, 1923, *A Ballad of William Sycamore*, 1923, and *Tiger Joy*, 1925, are decorative in style, but mature. His best work is the long narrative poem of the Civil war, entitled *John Brown's Body*, which was pub. in 1928, and was awarded the Pulitzer prize. His novels include *Young People's Pride*, 1922, *Jean Huguenot*, 1923, and *Spanish Bayonet*, 1926. *Tales before Midnight*, 1939, consists of short stories.

Benevento: 1. Prov. of Italy, in NE. Campania (q.v.). It is in the Apennines (q.v.) and is generally mountainous but is crossed E.-W. by the broad and fertile valley of the Calore, a trib. of the Volturno (q.v.). Area 812 sq. m.; pop. 334,000.

2. (anc. **Beneventum**), It. city, cap. of the prov. of B., situated in the valley of the Calore, 32 m. NE. of Naples (q.v.). It was the chief city of the Samnites (see **SAMNIUM**), and was taken by the Romans in the 3rd cent. BC. It was the cap. of a duchy of the Longobards (q.v.) from 571 to 1038, and was part of the States of the Church (q.v.) from 1052 to 1860, with the exception of a period during which it was in Fr. hands, 1799-1815. In 1806 Napoleon I made Talleyrand (q.v.) Prince of B. The tn suffered very severe damage during the Second World War. The 12th-cent. Romanesque archiepiscopal cathedral was ruined in the fighting of 1943; only the façade and the tower remain. There is a Rom. theatre, as well as a splendid triumphal arch of the Emperor Trajan (q.v.). Leather goods, confectionery, and liqueurs (*Sfrega*) are manuf. Pop. 50,200.

Benevolence, type of compulsory loan exacted by kings who dispensed with legal justification. It originated with Edward IV, though similar contributions had been levied in previous reigns. They were not, however, officially called B.s. They were declared unlawful by Parliament in 1484, but Richard III often resorted to this way of raising money, as did Henry VII and Henry VIII. James I attempted to raise B.s, though without material success. B.s were rendered illegal both by the Petition of Right, 1628, and by the Bill of Rights, 1689.

Benezet, Anthony (1713-84), Amer. Quaker schoolmaster, and anti-slavery pioneer, b. St Quentin, France, migrated with his Huguenot parents to Philadelphia (1731). He wrote and circulated many philanthropic tracts, chiefly on slavery, and collaborated with John Woolman (q.v.). In his last years he taught Negro children. His book *Some Historical Account of Guinea and the Slave Trade*, 1772, led Thomas Clarkson (q.v.) to devote his life to its abolition. See George Brooks, *Friend Anthony Benezet* (Life and Letters), 1937.

Benfeld, Fr. tn in the dept of Bas-Rhin, on the Ill. It produces tobacco and hops. Pop. 2600.

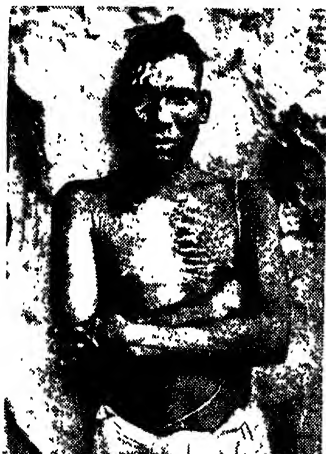
Benfey, Theodor (1809-81), Ger. philologist and Sanskritist. Prof. in Göttingen Univ., 1862 onwards. Main works: *Griechisches Wurzellexikon*, 1839-42; *Indien*, 1840; *Sāmavedārcikam*, 1848; *Handbuch der Sanskritsprache* (2 vols.), 1852-3; *Practical Grammar of Sanskrit Language*, 1863-8; *Sanskrit-English Dictionary*, 1866. In his celebrated work *Pantochoalantra*, 5 vols., 1859, he traced the Indian origin of many E. and W. tales and fables.

Benfleet, urb. dist. of Essex, England, adjacent to Southend-on-Sea, formed in 1929 out of the Rochford rural dist., and comprising the pars. of Hadleigh, South B., and Thundersley. Pop. 20,000.

Bengal Bay, of part of the Indian Ocean. It stretches between India and Burma and Malaya, washing the whole of the E. side of the country. It is visited by the monsoons, which prevail over the

whole area of the ocean. Many large rivers empty themselves into the bay—the Ganges and Brahmaputra from the N., while from the E. it receives the Irawadi, and from the W. the Mahanadi and Godavari. There are good ports on the E., but few on the W. The Andaman and Nicobar are the chief groups of is., which are numerous.

Bengal, Presidency of, prov. of India Until the 1947 partition, bounded on the S. by the Bay of Bengal, on the W. by Nepal, Bihar, and Orissa, on the N. by Sikkim and Bhutan, and on the E. by Assam and Burma. In 1947 the prov.



NATIVE OF BENGAL
A Pujara Brahman.

E.N.A.

was divided into two, W. B. (chiefly Burdwan div.) falling to India, with an area of 26,912 sq. m. and a pop. of 19,341,000. E. B. prov. (Pakistan), including the Sylhet div. of Assam, had an area of 56,008 sq. m. and an (estimated) pop. of 44,081,000. For details of the 2 divisions *see* BENGAL, WEST, and PAKISTAN, EAST.

History. The Muslim conquest of B. took place early in the 13th cent. It was first administered by governors appointed by the Muslim emperors; then for 2 cents. the governors ruled precariously as independent sovereigns. In 1576 it became a portion of the great Mogul empire and for a further 200 years was ruled by Mogul governors. In 1765 it passed under the administration of the E. India Co., which had here made its first settlements in 1633. An important event was the founding of Calcutta by Job Charnock, 1692. In 1858 administration was transferred to the Crown. The rights of proprietors and cultivators were assured

and protected by the Permanent Settlement of the Land Revenue Act and the Tenancy Act, 1793 and 1859 respectively. The former presidency of B. included most of NE. India; the prov. later consisted of B. proper, Bihar, Orissa, and Chota Nagpur; in 1905 the Sambalpur dist. was transferred to it from the Central Provinces, and the dists. of Rajshahi, Dacca, and Chittagong were detached and added to Assam. This partition, the cause of much political unrest, was revoked in 1911, and in 1912 B. was reconstituted, Bihar, Orissa, and Chota Nagpur being formed into a separate prov. (*see* BIHAR). A very grave situation arose in 1943. Famine conditions threatened as early as April, and from Aug. until the end of the year they were acute. Many thousands died of starvation. Cholera and other epidemic diseases followed in the wake of famine, and between 27 June and 13 Nov. 77,938 deaths from cholera were recorded. Altogether the total of deaths from all causes due to famine and disease was estimated at 690,000 during the year. Relief centres were estab. and nearly 6000 kitchens set up for the free distribution of food; at the same time the price of rice was controlled. The prov. gov. of B. was severely criticised for its maladministration, and a gov. inquiry was set up in 1944 under the chairmanship of Sir Archibald Rowlands. The report of this committee was pub. in Oct. 1945; the prov. was found to be under administered, its communications had been allowed to decline, and in particular the public health and medical services were inefficiently run. In Mar. 1945 the prov. gov. was defeated in the Assembly over the budget proposals, and resigned. As a result the normal administrative machinery broke down, both bodies were suspended by proclamation on 30 Mar. 1945, and the governor, Mr R. G. Casey, took over the direct administration of the prov. *See also* BENGAL, WEST, and PAKISTAN, EAST.

Bengal, West, state of India made up of the part of B. left to India after the 1947 div. (*see* BENGAL), together with a dist. of Bihar (q.v.) added in 1956. For its hist. *see* BENGAL. Most of B. is deltaic, alluvial land along the lower Ganges and its mouths, with a fringe of Himalayan mt. country. The climate is tropical in the plains, not excessively hot but oppressive due to the humidity.

Development. The long settled, densely populated delta is cultivated wherever crops can possibly be grown—and rice takes up most of the area; jute, tea, oilseeds, sugar, and tobacco are also grown. W. B. has some coal. Round Calcutta are many industries—nearly all the jute mills in India, her most important paper factories at Titaghar, chemicals, textiles, engineering, and leather goods industries. Fisheries and inland waterways are assets of importance; Bengalis, unlike most other Indians, eat a lot of fish. The Damodar valley project and the Kasai R. scheme will help the future development of the state.

Culture. B. was the first area in India to come under Brit. rule; it was the first to respond to the challenge of W. ideas—by accepting W. education, by social and religious reform movements, and by the literary and artistic renaissance. Calcutta Univ. (estab. 1857) is probably the largest in India. Bengal has produced writers like Tagore (q.v.), scientists like Bose (q.v.). At Santiniketan is the cultural centre founded by Tagore.

Government. The governor acts through ministers responsible to an elected assembly of 238. In India's Parliament W. B. has 16 and 36 seats in the Upper and Lower Houses respectively. The cap. is Calcutta (pop. 2,549,000). The other large tn is Howrah (pop. 434,000) across the riv. from Calcutta. Area 33,809 sq. m.; pop. 26.3 millions. See also **BENGAL** and **CALCUTTA**.

Bengal Hemp, name given to a species of Indian hemp (*Cannabis sativa*), from which bhang (q.v.) and hashish (q.v.) are derived. See also **HEMP**.

Bengal Light, or blue light, as it is called, is a vivid signal light used at sea. It is a composition of nitre, sulphur, and black sulphide of antimony, ground to a powder, dried, and mixed, by weight, in the proportion nitre 6, sulphur 2, and black sulphide of antimony 1. When this is lighted a brilliant blue light which illuminates the sea for miles around is the result. The B. L. is used in cases of shipwreck. Owing to the poisonous fumes from it the light cannot be used safely in enclosed spaces.

Bengali Language, belonging to the E. group of the Indo-Aryan languages, is spoken by about 55 million people in the prov. of Bengal. It is divided into sev. dialects, but literary B. is used all over the country in books and newspapers and when speaking formally. Oriya or Odri, spoken mainly in Orissa; Bihari, spoken in Bihar, Chota Nagpur, Oudh, etc.; and Assamese, spoken in the Assam valley, the most E. of the Indo-Aryan languages, are sister languages to B. B. literature goes back at least as far as the 15th cent. AD.

Bengawan, see **SOLO**.

Bengel, Johann Albrecht (1687–1752), Ger. scholar, b. Winnenden, near Stuttgart, pub. an ed. of the Gk Testament. His theological works were esteemed by John Wesley.

Benghazi, seaport, cap. of Cyrenaica, situated on the N. coast of Africa, in a prov. of the same name. It lies on a tongue of land separated from the mainland by a lagoon-like salt lake and a salt marshy tract. The harbour is only accessible to vessels of light draught. There are 2 narrow-gauge railways, and before the Second World War it was in regular steamship communication with Naples, Syracuse, Tripoli, and other tns. Many noteworthy buildings were erected and broad streets constructed under the It. occupation. The prov. and tn of B. were incorporated in the national ter. of Italy by a decree of 9 Jan. 1939. B. was captured by the Australians on 7 Feb. 1941, in spite of hard fighting by the

Italians under Gen. Bergonzoli. On 3 April, however, the Brit. and imperial forces evacuated the tn, and it was twice bombarded by the R.N. during May. It was again occupied by Brit. and imperial troops on 24 Dec. in an advance by Gen. Auchinleck, but was recaptured by the Ger. and It. forces under Rommel on 29 Jan. 1942. After the battle of El Alamein, B. once more, and finally, fell to the Brit. forces under Gen. Montgomery on 20 Nov. 1942. By this time, owing to repeated bombardment from the air, the tn presented a scene of utter desolation. Pop. 70,533 (Italians, 19,500; Jews, 3000; the remainder Arabs).

Benguela, cap. of the dist. of that name in Angola; terminus of the B. railway, which extends to Katanga (q.v.) in the Belgian Congo, the connection with the Bas-Congo-Katanga line being completed 1931. In 1956 the B. railway was linked to the Rhodesian system. The total cost, including the Lobito Bay port, was about £13,000,000, the greater part being provided by Brit. capital. Pop. (1951), all races, 14,690 (whites, 3346). See also **LOBITO BAY**.

Benguet, sub-prov. of Mt Prov. (pop. 278,120), Philippine Is. Rice is grown and there is lumbering. Copper- and gold-mining are concentrated in Mt Prov. Baguio, in B., has an administration independent of Mt Prov.

Ben-Gurion, David (1886–), Israeli statesman, b. Plonsk, Poland. On his arrival in Palestine in 1906 he became an agric. labourer. He soon achieved a prominent position in the Socialist-Zionist faction (*Poalei Zion*). Expelled by the Turks in 1915, he joined the Royal Fusiliers (Jewish Battalion), was promoted corporal and served in Egypt and Palestine. Under the Brit. mandatory gov. he adopted a more nationalistic approach towards Zionism than did Weizmann (q.v.), and carried with him the majority of the Jewish pop. of Palestine. In 1930 the Labour Zionist party (*Mapai*) was founded, with B.-G. as one of the leaders. He held the posts of chairman of the Jewish Agency Executive and leader of the Labour wing of the World Zionist Organisation, 1935–48. In 1942 he was the leading protagonist of the 'Biltmore Programme', claiming the whole of Palestine as a Jewish commonwealth. As leader of the majority party, he was appointed Prime Minister of Israel in May 1948 and retired in Dec. 1953. He returned to the gov. as Minister of Defence under M. Sharett in Feb. 1955 and resumed the premiership in Oct. of the same year. In domestic politics his main achievements have been to hold together diverse coalitions, to find common ground for the religious and secular elements, and to reduce friction between the oriental and occidental Jews. The military successes of Israel can partly be attributed to his firm measures in securing the unification of the differing defence forces *Haganah*, the *Palmach* special corps, and the *Irgun*. Against bitter opposition he secured the Ger. reparations agreement of 1952,

which has been of great value to Israel's precarious economy. In Oct. 1956, with Fr. support, he planned the invasion of Egypt and the Gaza Strip (q.v.), but felt compelled to order a withdrawal in accordance with the resolutions of the U.N. See B. Litvinoff, *Ben-Gurion of Israel*, 1954.



State of Israel:
Government Press Division

DAVID BEN-GURION

Benhadad, name of certain kings of Damascus mentioned in the Bible. B. I, son of Tabrimmon, ally of Abijam of Judah (915-913 BC), and of his son Asa (913-873 BC) whom he helped against Baasha, King of Israel (1 Kings xv. 19-20). He conquered Omri, King of Israel (885-874 BC), compelling him to surrender some cities and grant him trading ports in Samaria (1 Kings xx. 34), thus securing the road to the coast that Syria needed. Later in his reign Ahab, son of Omri (874-853 BC), fought unsuccessfully with his son B. II (c. 875-845), and was finally besieged in his cap., Samaria, but repentance saved him, and he not only recovered what Omri had lost, but had his trading posts set up in Damascus instead. The rise of Shalmaneser III of Assyria (859-824 BC) caused an alliance of the rivals, with other small states in self-defence, and the Assyrian was checked at the battle of Karkar on the Orontes in 853, where B. II put 1200 chariots, 1200 horse, and 20,000 foot in the field (D. D. Luckenbill, *Ancient Records of Assyria and Babylon*, 1926). Later that year Ahab again fought B. II for possession of Ramoth Gilead, and Ahab was mortally wounded in the siege (1 Kings xxii). B. III succeeded Hazael c. 800 BC. The dramatic story of the siege of Samaria,

miraculously relived in 2 Kings vi and vii, may have occurred in the reign of Jehoahaz, King of Israel (814-798 BC), rather than of his son Jehoash (788-783 BC) who respected Elisha. Jehoash defeated B. III thrice (2 Kings xiii. 25), and drove the Syrians from Cisjordan.

Benham, William (1831-1910), theologian, was tutor at St Mark's College, Chelsea, 1857-64; prof. of hist. at Queen's College, London, 1864-73; and rector of St Edmund's, Lombard St, in 1882. He trans. Thomas à Kempis's *Imitation of Christ*, 1874, and brought out an ed. of Cowper's letters in 1883. His best-known works are *A Short History of the Episcopal Church in America*, 1884, *A Dictionary of Religion*, 1887, and (in collaboration with Dr Davidson) *Life of Archbishop Tait*, 1891. He was chief editor of the *Ancient and Modern Library of Theological Literature*.

Benham, Sir William Gurney (1859-1944), compiler. He was educated at Merchant Taylors', then took up journalism, and from 1884 onwards was editor and proprietor of the *Essex County Standard*. His great work was his *Book of Quotations, Proverbs, and Household Words*, 1907. In addition he wrote sev. books on the archaeology of Essex. Three times elected Mayor of Colchester, he was knighted in 1935.

Beni: 1. Riv. in NW. Bolivia. It rises in the La Paz dept. and has a course of about 600 m. to join the Mamoré at Vila Bella. Its current is very strong, but it is navigable for some 500 m.

2. Dept. of Bolivia, with a good climate and fertile soil, yet thinly populated. Tropical rubber-bearing lowlands are in evidence. Trinidad is the chief tn. Area 80,300 sq. m.; pop. 73,900.

Beni, plural of the Arabic word *ibn* or *ibn*, a son. It occurs in E. geography as a component part of many names of families or tribes, as B. Temim, the sons of Temim, or the Temimides.

Beni-Hassan-el-Qadym, or **Old Beni-Hassan**, vil. of Middle Egypt, situated near the E. bank of the Nile. In the neighbourhood are catacombs.

Beni Saf, seaport, with harbour of 262 ft depth, in Algeria, 30 m. N. of Tlemcen, in the prov. of Oran. It exports iron ore found in the dist.

Beni-Suef, tn and prov. in central Egypt. The tn is on the W. bank of the Nile, 63 m. SSW. of Cairo, and is the centre for the produce of the prov. of Fayum. It has a cotton factory and alabaster quarries. Pop. of tn (census 1947) 57,464.

Benicarló, Sp. tn in the prov. of Castellón de la Plana, on the Mediterranean. It produces brandy and a rich, red wine, some of which is exported to Bordeaux for mixing with lighter wines. Pop. 8000.

Benin, former African kingdom, and now the name of a tn, dist., and riv. in the Federation of Nigeria, W. Africa. The inhab. (Beni) are pure negroes. B. was a great slaving centre, and was taken by the British in 1897, who found in the tn human remains everywhere, pits encumbered

with bodies in all degrees of decomposition, and altars reeking with human blood. The present Oba (chief) is an enlightened and educ. man. Products of the dist. include palm oil and kernels, and some rubber. The indigenous arts of B., particularly bronze, wood, and ivory crafts, are famous, being considered among the finest examples of non-W. art anywhere in the world (see NEGRO). Pop. 54,000 (of tn, 15,000). See also A. M. Boisragon, *The Benin Massacre*, 1897.

Benin, Bight of, in the Gulf of Guinea, between Capes Formosa and St. Paul. It consists of a continuous line of low, marshy, sandy shore, intersected by numerous rvs. and estuaries, more especially towards Cape Formosa, where they form alluvial ls., which are part of the delta of the Niger.

Benin River, riv. of Federation of Nigeria, W. Africa, which flows into the Atlantic after a course of 70 m.

Benjamin, youngest son of Jacob and Rachel, who d. at his birth and gave him the name 'Son of my sorrow' (Ben-oni). Jacob altered it to B., 'Son of my right hand', i.e. of Good Fortune (Gen. xxxv. 16-18).

Benjamin, tribe descended from the youngest son of Jacob and Rachel. It settled in an area bounded by Ephraim, Dan, and Judah. Its numbers declined under the Judges, but were increased again by the rape of 400 virgins from Shiloh. Although its ter. lay to the W. and E., it had contact with Judah, and it owed its increasing importance to its position between Judah and Ephraim. Though 'the least of the tribes,' it gave the nation its first king, Saul. Benjaminites were notoriously left-handed (cf. Judges iii. 15; xx. 16; and 1 Chron. xii. 1). They were also famous bowmen (1 Sam. xx. 20; 2 Sam. i. 22; 1 Chron. viii. 40; xii. 1; xiv. 8). Their battle-cry is recorded in Judges v. 14 and Hos. v. 8.

Benjamin, Arthur (1893-), Australian pianist and composer, b. Sydney. He came early to London to study at the Royal College of Music and after a short time as piano prof. at Sydney (1919-21) returned to England, becoming prof. at the R.C.M. in 1926. His works, which are numerous and varied, include 3 operas, a symphony, concertos, chamber and piano music, and songs. The opera *Prima Donna* has been very successful and the *Jamaican Rumba* for orchestra or 2 pianos is a great favourite.

Benjamin, Judah Philip (1811-84), Amer. lawyer and politician, b. at Croix, W. Indies. From 1853 to 1861 he represented Louisiana in the U.S. Senate. In the latter year he withdrew from the Senate to become attorney-general in Jefferson Davis's provisional gov. of the S. Confederacy, being subsequently appointed secretary of war, 1861-2, and secretary of state, 1862-5. Nicknamed 'the Soul of the Southern Confederation.' After the surrender of the Confederates B. escaped to England, and, entering Lincoln's Inn, was called to the Bar in June 1866. He practised on the N.

circuit, and in 1872 was made queen's counsel. He enjoyed a wide practice in appeal cases to the Judicial Committee of the Privy Council. His book *Benjamin on Sales* is a legal classic. Owing to ill health he retired to live in Paris in 1883, where he d.

Benjamin of Tudela, Jewish rabbi and author of the *Itinerary*, the son of Jonas of Tudela, was b. in the kingdom of Navarre in the 12th cent. Between 1140 and 1173 he travelled from Constantinople through Alexandria in Egypt and Persia to the frontiers of China. He wrote an account of his journey, which reveals the position of the Jews in the countries he visited, and this has been trans. from the Hebrew in French, English, and Latin.

Benjamin Tree (*Styrax benzoin*), tree of the family Styracaceae, native of Sumatra and Java. It yields the fragrant resin called gum benzoin or gum Benjamin, which is used in the manuf. of incense and in perfumery. See BENZOIN.

Benkoelen, see BENKULEN.

Benkovac, tn in Croatia, Yugoslavia. It is in a vine-growing dist. of Dalmatia, and has an anct. castle. Pop. 16,600.

Benkulen, Benkoelen, or **Bencoolen**, port on the SW. coast of Sumatra, Indonesia. The English settled there in 1685, and estab. an extensive trade. B. was ceded to the Dutch in 1825, and is now a trade centre. Pop. 13,000.

Benmore, see FAIRHEAD.

Benn, Gottfried (1886-1956), Ger. surgeon, poet and essayist, b. Mansfeld, son of a Lutheran parson. He studied medicine at the univ. of Berlin and, after the First World War, settled in Berlin as a specialist in skin disease. His early poems (*Morgue*, 1912; *Fleisch*, 1917) were about his profession. His works being banned during the Nazi régime, the first vol. to be pub. after the war was *Statische Gedichte*, 1948, followed by various poems and essays (*Der Ptolemäer*, 1949; *Doppelleben*, 1950; *Après lude*, 1953). B. developed a profound cynicism and pessimistic attitude in his poems and essays, and had a considerable influence on Ger. expressionism and lyric writing.

Benn, Sir John Williams (1850-1922), publisher and politician, b. Hyde. His work as a councillor on the London County Council earned for him the sobriquet of 'father of the L.C.C.' At first the whip, and afterwards the leader, of the 'Progressives,' he became chairman of the General Purposes and the Highways Committees and, in 1904-5, chairman of the council. He was made a baronet in 1914.

Benne Oil, also called gingili or teel oil, is expressed from the seeds of *Seamum indicum*, and is used in cookery, also for lighting, lubrication, medicine, and cosmetics. A favourite Indian cake is made with a mixture of this oil, honey, and citron.

Bennet, Henry, see ARLINGTON, EARL OF.

Bennett, Enoch Arnold (1867-1931), novelist and playwright, b. Shelton, Hanley-in-the-Potteries, N. Staffs, 27 May, and educ. at the Endowed Middle

School. Newcastle under Lyme, and London Univ. In 1889 he went into a solicitor's office in London, and stayed there till 1893, when he became assistant editor of *Woman*, of which paper he became editor, 1896-1900. His first story was *A Man from the North*, 1893. In the same year appeared *Journalism for Women*, and the next, *Polite Fancies*—his first plays. His prose fiction, from the first, he divided into novels and fantasies: by the latter (some in collaboration with Eden Phillpotts) he obtained fame and money; by the former, estab. himself as a literary artist. He first attracted the attention of the critical world with a description of life and conditions in the Five Towns of the Potteries, making his name with *Anna of the Five Towns*, 1902; and he was at his best when he returned to that theme—for, with all his acquired culture, B. was essentially a provincial. He was understood not to admire Dickens; yet it is in the delineation of the 19th-cent. Eng. eccentric that he, like Dickens, excels. Perhaps his best novel is *The Old Wives' Tale*, 1908. Other later works of fiction are *Clayhanger*, 1910, *The Card*, 1911, *Hilda Lessways* (sequel to *Clayhanger*), 1911, *The Ugent* (sequel to *The Card*), 1913, *The Price of Love*, 1914, *Three Twain* (sequel to *Hilda Lessways*), 1916, *The Pretty Lady*, 1918, *Mr Prohack*, 1922, *Lilian*, 1923, *Riccyman Steps*, 1923, *Lord Itaingo*, 1926, *The Strange Vanguard*, 1928, and *Acrident*, 1929. Among his plays are *Cupid and Common-sense*, 1908, *What the Public Wants*, 1909, *The Honeymoon*, 1911, *Milestones* (with E. Knoblock), 1912, *The Great Adventure*, 1913, *The Tittle*, 1918, *Judith*, 1919, *The Love Match*, 1922, *Body and Soul*, 1922, *London Life* (with E. Knoblock), 1924, and *Mr Prohack*, 1927. B. resided much in France, and, as touching his personal experiences, wrote *The Truth About an Author*, 1903, *The Reasonable Life*, 1907, *The Human Machine*, 1908, *How to Live on Twenty-four Hours a Day*, 1912, *From the Log of the Velsa*, 1920, *Things That Have Interested Me* (3 series), 1921, 1923, and 1925, and *Journal*, 1930-3. See studies by Georges Lafourcade, 1938; W. Allon, 1948; Reginald Pound, 1952.

Bennett, James Gordon (1795-1872), Amer. journalist, founder and editor of the *New York Herald* (q.v.). b. Newmills, Banffshire, in Scotland. Was educ. for the Rom. Catholic priesthood, but emigrated to America in 1819. He founded the *New York Herald* in 1835.

Bennett, James Gordon (1841-1918), son of the above. He succeeded to the management of the *New York Herald* on his father's death, dispatched H. M. Stanley to central Africa to find Livingstone, bore half the expense of Stanley's Congo expedition of 1874, arranged the *Jeannette* polar expedition, and promoted, with J. W. Mackay, the Commercial Cable Co. in 1883. He d. at Nice, and left money to found a home for journalists in New York.

Bennett, John Hughes (1812-75), pathologist, b. London. He was educ. at

Exeter and Edinburgh, and studied for 4 years in Paris and Germany. In 1841 he began to lecture on histology in Edinburgh, and from 1843 to 1874 was prof. of the institutes of medicine at Edinburgh. He pub. numerous treatises on medicine. He gave the first definite description of the blood disease leukaemia and he drew attention to the medicinal value of cod-liver oil.

Bennett, Richard Bedford, 1st Viscount (1870-1947), Canadian statesman. Descended from United Loyalist stock settled in Fundy Bay, his forebears began colonial life with a shipyard in N. Brunswick and building ships for riv. and coastwise trade. After taking his law degree at Dalhousie Univ., B. practised in New Brunswick. Later he went into partnership in Calgary, and entered the Legislature of the NW. Ter. First became prominent in politics as an opponent of the provisions for separate Catholic schools in the proposed prov. constitutions of Alberta and Saskatchewan. This gave him the leadership of the small band of Conservatives in Alberta's first legislature in 1905. At the 'reciprocity' elections of 1911 he was returned as a Conservative by Calgary by a large majority. He enhanced his reputation by his opposition to the railway policy of the Borden Gov. Being opposed also to the ministerial policy during the First World War, he withdrew from politics in 1917 and resumed the practice of law. Returned again for Calgary in 1925. In 1926 he was minister of finance. Soon in opposition again, he estab. himself as the best parliamentarian on the Conservative side, and was selected in 1927 to take the place of Mr Meighen as leader, and thereafter was chiefly responsible for getting the Conservatives back to power in 1930. He was an ardent champion of protective tariffs, came to London in 1930 as the head of the Canadian delegation to the Imperial Conference. Presided over the Ottawa (Imperial Economic) Conference, 1932. In the election of Oct. 1935 he sustained a crushing defeat. He was succeeded by Mr Mackenzie King as premier, and later by Menion as Conservative leader. In 1938 he took up permanent residence in England. Created viscount in 1941.

Bennett, Sir William Sterndale (1816-1875), composer and pianist, b. Sheffield. For 10 years he studied in the Royal Academy of Music and then visited Germany, where, at Düsseldorf and Leipzig, he made the acquaintance of Mendelssohn and Schumann (qq.v.). Returning to England he received a warm reception, and in 1838 was elected member of the Royal Society of Musicians. In 1849 he founded the Bach Society. In 1856 he became prof. of music at Cambridge, and was engaged as conductor to the Philharmonic Society the same year. This latter post he resigned on being appointed principal of the Royal Academy of Music in 1866. He received the honorary degree of D.C.L. from Oxford Univ. in 1870, and the following year was knighted. With the exception of opera, B. attempted

almost every form of vocal and instrumental composition. *The Naiads* and *The Wood Nymphs* (overtures), 4 piano concertos, and *The May Queen* (a cantata), were among his best-known works.

Bennettiales, important group of fossil gymnosperm plants of Mesozoic age. They are similar to cycads in habit and stem structure, but differ in the reproductive organs.

Bennigsen, Levin August Theophil, Count (1745-1826), Russian general, b. Brunswick. After a period in the Hanoverian service he entered the Russian Army and gained distinction in the Turkish and Polish wars. Aided in the assassination of Tsar Paul V. Commanded the Russian armies against Napoleon at Pultusk (1806) and Eylau (1807) and was present at Borodino (1812) and Leipzig (1813).

Bennington, township of the co. of R., Vermont, U.S.A. It has woollen mills, and manufs. textiles, paper, clothing, pottery, plastics, and wood products. Pop. 12,411.

Benoit, Camille (1851-1923), Fr. composer, b. Roanne, Loire. He was a pupil of César Franck. His works include an opera *Cléopâtre* and a symphonic poem *Merlin l'enchanté*. He was curator of the Louvre museum from 1895.

Benoit, Peter (1834-1901), Flem. composer, b. Harlebeke. In 1851 B. entered the Brussels Conservatoire, where he studied till 1855. There he composed an opera, *Le Village dans les montagnes*, but his later operas were set to Flem. librettos and began a Flem. national revival. He also wrote oratorios, cantatas, etc.

Benoit, Pierre (1886-), Fr. novelist, b. Albi, Tarn. He won an international reputation with his *Koenigsmark* (1918), a novel which is concerned with the fates of Count Philip Königsmark and Countess Platen. Among his other more notable works are *L'Atlantide*, 1922 *La Chaussée des géants*, 1922, on the Dublin riots of 1916; *Le soleil de minuit*, 1930; and *Le désert de Gobi*, 1941.

Benoit de Sainte-More (fl. c. 1150), Fr. troubadour. He wrote a long poem in octosyllable verse entitled *Chronique des Ducs de Normandie* at the suggestion of Henry II of England. His *Roman de Troie* (30,000 lines) is based on the *Historia de excidio Troiae* of Dares Phrygius, and the *Epithemerides belli Troiani* of Dictys Cretensis. The story, told as though it were a medieval romance, commences with Jason's theft of the Golden Fleece and ends with the return of the Greek heroes after the sack of Troy. B. is largely responsible for the popularity of the story of Troy in the Middle Ages.

Benoni, tn in the Transvaal prov. of S. Africa, 19 m. from Johannesburg, an important engineering and industrial centre. Pop.: Whites, 36 738; Bantu, 66,650; Coloureds, 3913; Asiatics, 1683.

Bensberg, Ger. tn in the Land of North

Bensley, Thomas (d. c. 1835), printer and producer of some of the finest and most magnificent books of his period. His chief production was Maeklin's folio Bible (1800) and his octavo Shakespeare is also well known. He was associated with Koenig in developing the first steam printing press, which was used by *The Times* in 1814.

Benson, Arthur Christopher (1862-1925), poet and essayist, the eldest son of Edward White B. (q.v.). Educ. at Eton and King's College, Cambridge, he became a master at Eton in 1885, continuing there until 1903, when he was elected a fellow of Magdalene College, of which he became master, 1914. In 1886 he produced his first work of fiction, *The Memoirs of Arthur Hamilton*, under the pseudonym of Christopher Carr. Two vols., *Poems and Lyrics*, pub. in 1893 and 1895 respectively, gave him a reputation as a writer of verse. Further literary productions of his were *Archbishop Laud, a Study*, 1887, *Lord Vyat and other Poems*, 1897, *The Life of Archbishop Benson*, 1899, *Fasti Etonenses*, 1899, *The Schoolmaster*, 1902, and *The House of Quiet*, 1904. He also wrote studies of D. G. Rossetti, 1904, Edward Fitzgerald, 1905, and Walter Pater, 1906. Among his other publs. are *Peace and other Poems*, 1905, *The Upton Letters*, 1905, *From a College Window*, 1906, *The Thread of Gold*, 1906, *Beside Still Waters*, 1907, *Joyous Gard*, 1913, *The Orchard Pavilion*, 1914, *Hugh* (memoir of his brother), 1915, *Meanwhile*, 1916, *Cambridge Essays on Education*, 1917, *Magdalene College*, 1923, *Memoirs and Friends*, 1924, *Chris Gascoyne*, 1924, *The Canon*, 1926, *Basil Neherby*, 1926, and *Cressage*, 1927. The last 4 are novels. He also ed. with Lord Escher *The Correspondence of Queen Victoria*, 1907, and he was the author of the words of 'Land of Hope and Glory,' for which Edward Elgar (q.v.) composed the music. See E. H. Kyle, A. C. Benson as seen by some Friends, 1925.

Benson, Edward Frederic (1867-1940), author, b. Wellington College, 24 July, the son of Edward White B. (q.v.). He was educ. at Marlborough and King's College, Cambridge. From 1892 to 1895 he was engaged in investigations at Athens on behalf of the Brit. Archaeological Society. In 1893 he pub. his first novel *Dodo*, a story of society life. Other novels: *Vinlage*, 1898; *The Caprina*, 1899; *The Challoners*, 1904; *The Image in the Sand*, 1905; *The House of Defence*, 1907; *The Osbornes*, 1910; *Dodo the Second*, 1914; *The Countess of Lovelace Square*, 1920; *Dodo Wanders*, 1921; *David of King's*, 1924; *Mezzanine*, 1926; *Paying Guests*, 1929; *Travail of Gold*, 1933. He was also the author of 2 plays, *Aunt Jeannie*, 1902, and *Dinner for Eight*, 1915. His study of the life of Charlotte Brontë was pub. in 1932, and *King Edward VII* in 1933. He dealt with the hist. of his own times in two volumes of his own memoirs, *As We Are*, 1932, and *As We Were*, 1934.

Benson, Edward White (1829-96), archbishop, b. Birmingham. Entering Trinity College, Cambridge, in 1848, he

was elected fellow in 1853. From this date until 1859 he was a master at Rugby, being appointed in the latter year headmaster of the newly opened Wellington College. In 1869 he was made prebendary, and in 1872 chancellor, of Lincoln. In 1877 he was appointed first Bishop of Truro, and on the death of Dr Tait succeeded him as Archbishop of Canterbury (1883). As primate he cultivated cordial relations with the E. churches. He imparted new vigour to church life in England and reorganised the internal administration of the Church. Many of his numerous writings possess considerable scholastic and antiquarian value. See life by A. C. Benson (son), 1899.

Benson, Sir Francis Robert (1858-1930), actor manager; educ. at Winchester and Oxford. While at Oxford he played the part of Clytemnestra in the *Agamemnon* of Aeschylus, and was invited to join Sir Henry Irving's company at the Lyceum. In 1883 he founded a Shakespeare repertory company, which continued until 1916, giving performances not only in London and the provs., but also in U.S.A. and Canada. In 1920, after the war, a new company was started and toured S. Africa. B. himself played about 100 parts, the majority from Shakespeare, and estab. a school of acting which had a marked influence on the Eng. stage. He was also responsible for many of the Shakespearian festivals at Stratford upon Avon. He was knighted in 1916, and in 1934 awarded a civil list pension of £100 in recognition of his services to drama. In 1886 he married Gertrude Samwell, who was a member of his company under the name of Constance Featherstonhaugh.

Benson, Richard Meux (1824-1915), missionary and founder of the Cowley Brotherhood. Author of *Spiritual Readings*, 1879, and *War Songs of the Prince of Peace*, 1901, both mystical in conception.

Benson, Robert Hugh (1871-1914), author and priest of the Rom. Church, the son of Edward White B. (q.v.). He was educ. at Eton and Cambridge, and held curacies for some years as a priest of the Eng. Church, but in 1903 was converted to Rom. Catholicism. He wrote both novels and religious works. Some of his novels are historic romances and most of his later works of fiction are vehicles for Catholic propaganda. The best known are *The Light Invisible*, 1903, *By What Authority?*, 1904, *The King's Achievement*, 1905, *The Sentimentalists*, 1906, *The Queen's Tragedy*, 1906, *Lord of the World*, 1907, *The Conventionalists*, 1908, and *The Dawn of All*, 1911. His poems were pub. shortly after his death. See *Hugh*, 1915, by his brother, A. C. Benson, and *Life*, 1916, by Father C. C. Martindale.

Benson, Stella (1892-1933), novelist, b. Much Wenlock, Shropshire, a niece of Mary Cholmondeley (q.v.). She was educ. privately. During the First World War she worked in London on social services, for the women's vote movement, and on the land. Later for reasons

of health she travelled in the U.S.A. In 1921 she married J. C. O'Gorman Anderson of the Chinese Customs Service, and lived in China, dying at Tongking. Her novel *Tobit Transplanted* won the Femina Vie Heureuse prize in 1931. She left a jour. of 20 vols. to Cambridge Univ. for pub. in 50 years' time. Other novels include *I Pose*, 1915, *This is the End*, 1917, *Living Alone*, 1919, and *Good-bye, Stranger*, 1926. Her short stories have been pub. in a collected ed. See R. Ellis Roberts, *A Portrait of Stella Benson*, 1939.

Bent, James Theodore (1852-97), traveller and archaeologist, b. near Leeds. He was educ. at Repton and Oxford. He visited Italy and Greece, and in 1885 began investigations in Asia Minor. In 1891 he visited S. Africa, exploring the great Zimbabwe ruins in Mashonaland. In 1893 he explored parts of Arabia and Abyssinia. Chief works: *The Cyclades, or Life among the Insular Greeks*, 1885; *The Ruined Cities of Mashonaland*, 1892; *The Sacred City of the Ethiopians*, 1893.

Bent Grass, see AGROSTIS.

Bentham, George (1800-84), botanist, b. at Stoke, near Plymouth. A nephew of Jeremy B., he was attracted to the study of botany through the applicability thereto of the analytical methods learnt from his uncle. For some years he lived in France managing his father's estate, eventually coming to England to study law and to assist his uncle. On his uncle's death in 1832 he was able to follow his scientific inclinations, and in 1842 removed to Herefordshire to devote himself entirely to science. The cost of maintaining his herbarium proved too expensive, and in 1854 he presented his collection to Kew Gardens, where he worked until his death. He wrote sev. important treatises, the chief being *Genera Plantarum*, and was elected F.R.S.

Bentham, James (1708-94), writer on architecture. Educ. at Trinity College, Cambridge, he became prebendary of Ely Cathedral in 1779. B. directed his attention to the study of church architecture, and his *History of the Church of Ely* was pub. in 1771.

Bentham, Jeremy (1748-1832), writer on law and political economy; the son of Jeremiah B., a solicitor of London. Educ. at Westminster and Oxford. Studied law and was called to the Bar about 1772, but did not practise to any great extent. He had attended, at Oxford, Blackstone's lectures on Eng. law, but was not satisfied with him. His first pub., *Fragment on Government*, 1776, was an attack on Blackstone, and was attributed by Johnson to Dunning. In 1780 he wrote his *Principles of Morals and Legislation*; it was printed but not pub. until 1789. In 1785 he went abroad and travelled over the greater part of Europe, and on his return in 1791 pub. his *Panopticon or The Inspection House*, a valuable work on prison discipline. This was his proposed circular prison with cells round the warders' well in the centre, and it was taken up by the gov., experimented upon at great expense,

and dropped. At this time B.'s fame abroad was greater than here, and every embryo rep. looked to him. Borrow met an *alcaide* near Finisterre who spoke of the 'great Baltham.' From about 1817 on he was a bencher of Lincoln's Inn; he d. at Westminster. He left his body to be dissected, and the skeleton may be seen at Univ. College, London. Among his other works are *Discourse on Civil and Penal Legislation*, 1802, *Punishments and Rewards*, 1811, *Parliamentary Reform*, 1817, and *A Rationale of Judicial Evidence*, 1827. The prophet of utilitarianism and the herald of all manner of social and legal reforms, the greatness of B. grows with time and with the realisation of his amazing grasp of so many and



JEREMY BENTHAM

diverse subjects, his power of unerring prophecy, and his universal tolerance in an age which, judged by modern standards, was harsh in the extreme. The older Benthamites had misjudged him. Even thinkers like James Mill regarded him as a visionary, an obscure jurist among greater jurists, a kind of catfish among the lawyers, a philosopher whose hedonistic calculus was devoid of practical value, and the defender of moneylenders. This misconception was due to his works not being read or not closely read by those who criticised him. The human and sensitive B., too, was forgotten in this hasty appraisal. The reforms for which B. was directly or indirectly responsible in the process of time, eloquently proclaim alike the catholicity of his learning and the liberality of his opinions. These reforms include the reform of the representative system of Parliament; the mitigation of the terrible criminal law, the abolition of transportation, and the improvement of prisons; the abolition of imprisonment for debt; the overhauling of the jury system; reforms in merchant shipping; the introduction of uniform and scientific methods of drafting Acts of

Parliament; the reform of the Poor Laws; the abolition of religious tests; the development of savings banks, friendly societies, cheap postage, census returns, registration of births and deaths, real property registration, national educ., protection of inventors, and public health legislation. It is also to be remembered that B., in his proposals for perpetual peace in the shape of a congress or diet working towards disarmament and the abolition of secret diplomacy, gave what was practically an outline of the modern Covenant of the League of Nations. (On this last point see C. John Colombas, *Outline of League of Nations Constitution*—(Grotius Society Publications.)) B. also played no inconsiderable part in the building up of the Brit. Empire, in which connection the colonisation of Australia and the Indian penal code both owed much to his inspiration. It is small wonder that Talleyrand could say of him: 'Pillé par tout le monde, il est toujours riche.' B.'s numerous works have never been adequately or completely pub., a number of MSS. and much correspondence never yet having been printed. His total output would probably fill some 60 vols. of the size of the *Travail*. His works, in 11 vols. (closely printed), including a biography and selected letters, were ed. by Sir John Bowring (q.v.), 1838-43. Bowring also ed. the *Deontology*, 1834. B.'s MSS. are preserved and catalogued in Univ. College, London Univ. (consult T. Whittaker's *Report*, 1892). There are trans. of his works in most languages, in which connection it may be recalled that B., early in his career, was almost a Frenchman. The work of Prof. Élie Halévy, of the *École Libre des Sciences Politiques*, Paris, has done much to make B. and his work better known to the scholars of his native land. See CLASSICAL ECONOMISTS. See also L. Stephen, *The English Utilitarians*, 1900; C. M. Atkinson, *Jeremy Bentham*, 1906; G. Wallas, *Jeremy Bentham*, 1922; C. Philipson, *Three Criminal Law Reformers*, 1923; J. S. Mill, *On Bentham and Coleridge* (ed. F. R. Leavis, 1950).

Bentham, Sir Samuel (1757-1831), naval architect and author of sev. works on naval administration, the brother of Jeremy B. He travelled for some years in Russia, and became an officer in the Russian service. On his return to England he became inspector-general of naval works.

Benthamia, genus of plants now included in *Cornus* (q.v.).

Bentheim, Ger. tn in the Land of Lower Saxony (q.v.), 107 m. W. of Hanover (q.v.). It is the chief tn of the B. dist. on the Dutch border, and has a 12th-cent. castle. There are minor industries, and mineral springs near by. Pop. 10,000.

Bentinck, Hans William, 1st Earl of Portland (c. 1649-1709), son of Henry B. of Diepenheim, Overijssel. As a boy he was attached to the Orange household and grew to be William III's close friend and confidential adviser. He helped to negotiate William's marriage with Mary, daughter of James II, and was entrusted

with the preparations for William's landing in England in 1688, the success of which placed William and Mary on the Eng. throne. He served with distinction at the battle of the Boyne, 1690. B. was rewarded for his services by being created Earl of Portland and receiving other honours.

Bentinck, Lord William George Frederick Cavendish (1802-48), politician and sportsman, third son of the 4th Duke of Portland. He entered the army in 1819 but retired in 1822 to become private secretary to his uncle, George Canning, and in 1828 became M.P. for King's Lynn. He voted with the Tories until 1846, when he became leader of the Protectionist party, created in consequence of Sir Robert Peel's conversion to Free Trade principles. B. was also famous as a race-horse owner.

Bentinck, William Henry Cavendish, 3rd Duke of Portland (1738-1809), statesman. He entered Parliament as a Whig in 1761, and held office under Rockingham in 1765 and 1782. He was put forward as nominal leader of the coalition ministry by Lord North and Fox in April 1783, but resigned in Dec. With the outbreak of the Fr. Revolution his interest in politics reawakened, and for 7 years he was home secretary in Pitt's Tory administration (1794-1801). He again became Prime Minister, 1807, but being unequal to the task resigned in Oct. 1809.

Bentinck, Lord William Henry Cavendish (1774-1839), general and administrator, second son of the 3rd Duke of Portland. He entered the army in 1791, and in 1803 was nominated Governor of Madras. He introduced reforms which provoked a Sepoy mutiny, and was recalled in 1807. He became Governor-General of Bengal in 1827, and first Governor-General of India, 1833-6.

Bentiv, or Bientveo, *Tyrannus sulphuratus*, species of Tyrannidae. The former is the Portuguese and the latter the Sp. name of the bird. It is related to butcher-birds (see SHRIKES), and feeds on carrion and reptiles. W. H. Hudson gives its scientific name as *Pitangus boliviensis*. He states that it has a wide range in S. America down to Buenos Aires, and that it is named from its trisyllable cry in which some people fancy there is a resemblance to the words Bientveo (I see you well).

Bentivoglio, Ercole (1506-73), It. poet, grandson of Giovanni B. (q.v.). He addressed some sonnets to Tullia d'Aragona, wrote sev. satirical works mocking the cult of Petrarch, and 4 comedies, 2 of which are extant: *Il Geloso*, 1544, and *I Fantasmi*, 1547.

Bentivoglio, Giovanni (d. 1508), It. ruler of Bologna, son of Annibale B., who, governing Bologna for sev. years, was murdered by a rival faction in 1446. Giovanni was then a boy of 6 years of age, but in 1462 he made himself master of Bologna. Though stern and vindictive in his gov., B. was a patron of the arts and of learning; he adorned Bologna with fine buildings and made collections of statues and paintings, and of MSS. Penn

Julius II expelled him from Bologna in 1506, and he was obliged to escape with his family into Milanese ter., where he d. 2 years later. In 1512 the surviving members of his family emigrated to Ferrara, where they settled under the protection of the Duke d'Este.

Bentivoglio, Guido (1579-1644), It. statesman, b. Ferrara, a descendant of the B.s who had been rulers of Bologna in the preceding cent. He studied at Padua, and returned to Ferrara in 1597. In 1601 he was made a prelate of the papal court. After the death of Clement in 1605 his successor, Paul V. sent him as nuncio to Flanders, where he wrote a hist. of the 16th-cent. Flemish revolt against Sp. rule. In 1616 B. was sent as nuncio to France, where he gained great influence at Louis XIII's court.

Bentley, Edmund Clerihew (1875-1956), journalist and novelist, b. London. He was educ. at St Paul's and Oxford, where he was president of the Union and captain of the boat club. After studying law he turned to journalism and wrote first for the *Daily News* and then for the *Daily Telegraph*. In *Biography for Beginners*, 1905, he produced a new literary medium, called after him the clerihew (q.v.), a four-line poem with extreme metrical licence, which has come to rival the limerick as a vehicle for nonsense. Two more collections of these four-line biographies appeared in 1929 and 1939. Meanwhile his novel, *Trent's Last Case*, 1936, showed new possibilities in the detective story, which he treated with a light-hearted abandon which has since found many imitators. It was followed by *Trent's Own Case*, 1936, in which he collaborated with H. Warner Allen, and *Trent Intervenes*, 1938, a vol. of short stories. In 1940 appeared *Those Days: an Autobiography*.

Bentley, John Francis (1839-1902), architect, b. Doncaster, was trained as an engineer and builder. In 1862 he joined the Church of Rome, and started practice as an architect. Up to 1895 his work consisted of houses, schools, and churches in the Gothic style—notably the fine Church of the Holy Rood at Watford, 1887. In 1895 he was appointed architect for the great new Rom. Catholic Cathedral at Westminster. The authorities having decided that the building must be Byzantine in style (in order to avoid rivalry with the Gothic of Westminster Abbey not far away), B. made an extensive tour of south-eastern Europe in order to study Byzantine architecture. His design, as carried out, shows an original treatment of the style; but he did not live to see the completion of the building, and the decoration is still (1957) unfinished. See biography by W. de l'Hôpital, 1919.

Bentley, Richard (1662-1742), clergyman, scholar, and critic, b. Oulton, Yorks, son of a farmer. Educ. at Wakefield and St John's College, Cambridge, he became a schoolmaster at Spalding, 1682, but left this to be private tutor to the son of Dr Stillingfleet (afterwards Bishop of Worcester). He accompanied his charge to Oxford, and was soon admitted to the

degree of M.A. Here he had access to the Bodleian library, and gained the friendship of Mill, the editor of the *Gk Testament*, and Bernard, then Savilian prof. He laid the foundation of his reputation in a dissertation on an obscure chronicler, John Malalas or John the Rhetor (real name John of Antioch), which was pub. with an appendix to Dr Mill's ed. of the author in 1691. In 1692 he was appointed Boyle Lecturer and in 1694 keeper of the Royal Library; his degree of D.D. he took at Cambridge in 1696. To the ed. of Callimachus by Graevius in 1697, he contributed a collection of fragments of that poet. It was now that his famous quarrel with the Hon. C. Boyle began. The latter was to edit the *Epistles of Phalaris*; and noticing (rightly or not some want of courtesy on the part of B regarding the loan of a certain MS. in the king's library, inadvertently upon it with some petulance in his preface. B. who had decided before (as was right) that these epistles were spurious, said so in Wotton's *Reflections on Ancient and Modern Learning*, and criticised Boyle's performance with some asperity. In 1700 he became master of Trinity College, Cambridge, and next year he married Joanna Bernard. He helped Kuster with an ed. of Suidas, effected the pub. of Cotes's ed. of Newton's *Principia*, 1709-1713, and pub. an ed. of Horace, 1711; he wrote 2 critical letters on Aristophanes, and in 1708 sent to Hemsterhuis a valuable letter containing emendations of the fragments of comic writers in Julius Pollux's *Onomasticon*, an ed. of which Hemsterhuis had just pub. If his learning was great, his manners were harsh and overbearing, and he quarrelled with the fellows of his college, and was deprived by the visitor, Bishop Greene. B., however, by a great number of expedients, resisted the deprivation for 4 years, and the matter was dropped. In 1717 he was, by his bold and unscrupulous manoeuvres, elected regius prof. of divinity; litigation followed as usual, and as usual B. won. His valuable ed. of Terence appeared in 1726. He undertook an ed. of *Paradise Lost* in 1731, supposing that Milton's amanuensis was likely to have committed blunders in taking down the poet's words; if his criticisms and emendations are prosaical, they are ingenious, and Pope had no business to put him into the *Dunciad*. Of B. we can only say that what he lacked in manners and modesty (and he lacked a good deal) he made up in learning. His style was strong and flexible. Swift's *Battle of the Books* has an account of B's quarrel with Boyle. See J. H. Monk, *Life of Richard Bentley*, 1830; Sir R. C. Jebb, *Bentley*, 1882; H. C. Beeching, *Francis Atterbury*, 1909; J. W. Mackail, *Bentley's Milton*, 1924.

Bentley: 1. coal-mining tn (Bentley-with-Arksey) of the W. Riding of Yorks, England, near Doncaster. Pop. 19,826.

2. Vil. of Hants, England, 4 m. SW. of Farnham. A considerable amount of Rom. pottery of the 1st to 4th cents. AD was unearthed in Alice Holt Forest, near B. in 1945. Pop. 800.

Benton, Thomas Hart (1782-1858), Amer. statesman, b. Hillsboro, N. Carolina. He represented Missouri in the U.S. Senate 1821-51, being eventually rejected on account of his opposition to slavery. His attitude on this question, his opposition to the proposed estab. of a U.S. bank, and his advocacy of Amer. expansion in the W., made him prominent in Amer. politics. Editor of *An Abridgment of the Debates of Congress from 1789 to 1856* (16 vols.), 1857-61. See his autobiography, *Thirty Years' View* (2 vols.), 1854-6.

Benton Harbor, city in Michigan, U.S.A., on St Joseph It. across from St Joseph, at Lake Michigan, in a fruit-growing area. It is a resort with mineral springs and beaches. It has canning plants and manufs. hardware, tools, machinery, and boats. The House of David, a religious settlement, is here. Pop. 18,800.

Benue, largest and most important affluent of the It. Niger, W. Africa, which it joins at Lokoja, 230 m. above its mouth. It rises in Adamawa, and flows through fertile country, navigable for 700 m., thus affording a highway into the centre of Sudan. Explored by Baikie in 1854 and 1862, and Flegel, 1879-83.

Benvenuto Cellini, see CELLINI, BENVENUTO.

Benvenuto Tisio, see GAROFALO.

Benyowsky, Moritz August, Count von (1741-86), Hungarian soldier and adventurer; b. Hungary; in 1756 fought for Austria in the Seven Years War. In 1767 he joined the Poles in their struggle against Russia; he was captured and subsequently took part in various intrigues against the Russian empress, but eventually escaped to France. The French gave him permission to establish a settlement in Madagascar, where he ultimately lost his life in a skirmish. See his *Travels*, trans. into English, 1790.

Benz, Karl (1844-1929), Ger. engineer, who, as long ago as 1885 built a motor-car driven by benzine at a speed of 15 m.p.h. His work was a valuable basis for subsequent developments of the internal-combustion engine.

Benzaldehyde (C_6H_5CHO), colourless liquid with an odour of bitter almonds. It is produced naturally in bitter almonds, cherries, and peaches in the form of amygdalin (q.v.). It is also prepared from toluene which is converted into benzal chloride and then heated with milk of lime. Alternatively toluene is oxidised by means of chromyl chloride, or a mixture of manganese dioxide and sulphuric acid with copper sulphate as catalyst. See ALMONDS, OIL OF.

Benzamide ($C_6H_5CONH_2$), organic compound formed by reaction of ammonia with benzoyl chloride. It crystallises in leaflets which melt at 130° C. and boil at 288° C.

Benzedrine, a benzyl-ethylamine ($C_6H_5CH_2CH(CH_3)NH_2$). It may be inhaled under medical advice to relieve hay fever, etc. Administered internally, it is a powerful nerve stimulant, and produces a temporary sensation of well-being.

Benzene (C_6H_6), compound of carbon

and hydrogen produced in the distillation of coal-tar and on a large scale by petroleum cracking (q.v.). It occurs naturally in Borneo petroleum. It was discovered by Faraday in 1825 as produced in the distillation of certain oils and fats, and Hoffman in 1845 showed that it was a constituent of coal-tar. To separate the various hydrocarbons in coal-tar, the substance is distilled in a tar-still, the products being drawn off at different temps. The first fraction is taken up to 210° C., and contains a large percentage of B. The distillate, known as 'light oil,' is again fractionated, producing separate distillates of 'first runnings,' 'heavy benzols,' and 'carbolic oil.' A further distillation of the benzols in a steam-still produces pure or nearly pure B. B. is a light, colourless liquid with a pleasant odour. It crystallises in rhombic form at 0° C., melts at 5.4° C., and boils at 80.4°. It is insoluble in water, but dissolves in alcohol, ether, acetic acid, and carbon disulphide. It readily dissolves gums and fatty substances, as well as phosphorus, sulphur, and iodine. B. is interesting chemically as being the parent of the aromatic compounds. The atoms of carbon are represented in a graphic formula as being arranged in a closed ring, each atom being connected with an atom of hydrogen. The replacing of these atoms by other atoms or groups gives rise to a large number of derivatives, which have in general more strongly marked characteristics and are more stable than the aliphatic or fatty compounds. B. is used commercially as a solvent, and as a starting-point in the production of many valuable dyes. The name is often applied to benzol, which consists of B. and toluene. This mixture is largely employed as a fuel for internal combustion engines. Benzine (q.v.) is a distillate from Amer. petroleum, and is much used as a solvent. Benzoline is a name applied to a form of benzine; it is used as a solvent and as a fuel.

Benzidine ($C_6H_4N_2$, or $p:p'-H_2N-C_6H_4-C_6H_4-NH_2$), primary aromatic amine produced by the reduction of nitrobenzene to hydrazobenzene and heating this in acid at c. 80° C. Crystallises from water in large silky plates, melting-point 127.5–128° C. It is mainly used in the preparation of diazo direct cotton dyes (see DYES).

Benzil ($C_6H_5CO \cdot CO \cdot C_6H_5$), organic solid, crystallising in trapezohedra, melting-point 95° C. It is produced by treating benzoin ($C_6H_5 \cdot CHOH \cdot CO \cdot C_6H_5$) with chlorine and nitric acid, or by fusing it with an alkali.

Benzene, volatile liquid obtained from petroleum. The name has been applied to different organic compounds. The hydrocarbon now known as benzene (C_6H_6) (q.v.) was originally known as B., and the name was afterwards and is still applied to the partially purified coal-tar which contains benzene as its prin. constituent. The term B. is, however, most commonly applied to the lower boiling-point fractions in the distillation of petroleum, and has thus a kinship with

petrol, petroleum spirit, motor spirit, benzoline, etc. It is valuable as a solvent, and is used for cleaning wearing apparel, etc. It is also produced on a large scale from the cracking of petroleum (q.v.).

Benzoic Acid ($C_6H_5 \cdot COOH$), aromatic acid, occurring naturally in some resins, especially gum benzoin and in Peru and Tolu balsams. It may be obtained from gum benzoin by sublimation, from toluene by oxidation, and from hippuric acid by hydrolysis. It crystallises in light feathery plates, which melt at 121.4° C. and boil at 250° C. It is readily soluble in hot water, alcohol, etc. When heated with lime benzene is produced, and salts called benzoates are formed by combination with the oxides of many metals. In medicine it is used as an antiseptic, expectorant, and diuretic. Moderate doses remain unchanged in the blood, but unite with glycocoll in the kidneys to form hippuric acid. It is useful in mild chronic cystitis and in urethral affections.

Benzoin (from Arabic *luban Jawa* (*luban-jaw*), incense of Java), balsamic resin obtained from *Styrax B.* It is produced by cutting the bark of trees, and is apparently the result of the wound, and is not secreted by the plant under ordinary conditions.

Here are different varieties containing varying proportions of the active ingredient, benzoic acid, while in some samples this is partly or wholly replaced by cinnamic acid. B. has a fragrant odour, and is much used for incense, perfumery, and pastilles. It became a favourite medicament on account of its antiseptic property and its soothing influence in affections of the respiratory organs. The most popular form of the medicine is the compound tincture, or friar's balsam, which is used externally for sores, ulcers, etc., and internally for throat troubles. Inhaling the vapour produced by adding a small quantity of friar's balsam to hot water may give relief for catarrh and influenza.

Benzoline, mixture of hydrocarbons (also known as benzine, petroleum spirit, or petrol). It is not a definite chemical compound, and consists of the lighter fractions in the distillation of petroleum or paraffins. It is used as a solvent in industry, and in medicine for heating cauteries and for cleansing the skin in acne. It is also used in oil engines to provide the inflammable vapour which, mixed with air, produces the explosion or expansion of gases which actuates the piston. It must be distinguished from benzol or benzene, which are products of coal-tar distillation, though, like them, it has valuable solvent powers.

Benzoyl, organic radical represented by the formula $C_6H_5 \cdot CO$. In 1832 Baron Liebig, in association with F. Wöhler, published a paper showing that throughout a series of compounds formed from benzaldehyde, or oil of bitter almonds, a group which he called B. behaved as a unit. A new era in chemical theory was thus inaugurated which led to far-reaching results. See RADICAL.

Benzoyl-glycocol, see HIPPURIC ACID.

Benzyl, organic group $C_6H_5.CH_2$, is the radical of a large number of types of organic compounds. It is not stable in the free state (see **RADICAL**).

Benzyl Alcohol ($C_6H_5.CH_2.OH$), or **Phenyl Carbinol**, organic compound found in Peru and Tolu balsams and in storax. It may be prepared by reducing benzoyl chloride or by shaking up caustic potash with benzaldehyde, when the product is partly potassium benzoate and partly B. A. It is a colourless liquid with pleasant odour, and boils at $206^\circ C$.

Benzyl Chloride ($C_6H_5.CH_2.Cl$), organic substance produced by the action of chlorine on boiling toluene. By the addition of potassium carbonate, benzyl alcohol is produced, and heating with lead nitrate produces benzaldehyde, or oil of bitter almonds.

Beograd, see **BELGRADE**.

Beowulf, O.E. epic poem of over 3000 lines, possibly the oldest poem in a modern language. It recounts 2 adventures of B., a legendary hero. In the first he slays Grendel, a monster which has been terrorising the land of Hrothgar, King of the Danes; in the second he slays a dragon, but is himself mortally wounded. Historical events mentioned in the poem belong to the 5th cent., but the date of its composition is less certain. Recent authorities suggest that it was written about the end of the 7th cent. in Northumbria by a Christian poet working on older pagan material. The MS., which is of the late 10th cent., formed part of Sir R. Cotton's collection, and is now in the Brit. Museum. Eds. by F. Klaeber (3rd ed.), 1950, and C. L. Wrenn, 1953. Verse trans. by W. Morris, 1892, and G. D. Bono, 1945; prose trans. by J. R. Clark Hall, revised C. L. Wrenn, 1950. See also R. W. Chambers, *Introduction to Beowulf* (2nd ed.), 1932, and D. Whitlock, *The Audience of Beowulf*, 1951.

Bequest, **Bequest**, 2 words strictly applicable in Eng. law to the disposition of personal property by will, 'devise' being the technical term applicable to dispositions of real property. See **WILLS** and **TESTAMENTS**.

Beracans, see **BEREANS**.

Béranger, Pierre Jean de (1780-1857), Fr. poet, b. Paris. At the age of 9 he came under the protection of an aunt at Péronne and became a printer's apprentice for 3 years at the age of 14. B. subsequently returned to Paris, and devoted himself to literature. At this time he lived in a garret, which forms the subject of one of his songs. Adversity shattered some of his dreams, and he was forced to solicit help from Lucien Bonaparte. In 1815 he pub. his first collection of songs, and was immediately hailed as the foremost of his country's song-writers. His popularity increased, and also his courage in airing revolutionary ideas, for which in 1821 he was imprisoned in St Pélagie. By his influence with the people, especially with the younger generation, he contributed largely to the downfall of the Bourbons. Many of his best-known verses were printed satires against the gov. which succeeded the fall of Napoleon. The

mocking irony of his famous *Roi d'Yvetot*, saluting the awakening of more truly liberal ideas, had a pronounced effect. In 1828 he was condemned to 9 months' imprisonment and to pay a fine of 10,000 francs. This was paid by public subscription, and B.'s popularity increased as a result of his conviction. In 1830 *Chansons nouvelles* were pub., and 10 years later his life story. The versatility of theme and delicacy of his humour and pathos easily explain his hold upon a public so warm as the working class of France, while his technique and literary quality endeared him no less to the literary scholars of his day. See J. Janin, *Béranger et son temps* (2 vols.), 1866, and J. Lucas-Dubreton, *Béranger*, 1934.

Béranger's Balance, see **BALANCE**.

Berar, an area in Madhya Pradesh state, India, lying to the N. of the state of Hyderabad (q.v.). Up to the beginning of the 19th cent. it was under the rule of an independent rajah with cap. at Nagpur, and later passed to the control of the nizām of Hyderabad, who assigned the ter. to the British in 1853. In 1902 it was leased in perpetuity by the nizām, and incorporated with the Central Provs, now Madhya Pradesh, on 1 Oct. of that year.

Borat, or **Bellgrad**, tn of Albania, on the Semeni R. in a fertile valley, the cultivation of which is mainly tobacco, vines, and olives. There is an oil pipeline to Avlona (Vlonë) on the coast. The tn was occupied by the Austrians and later the Italians during the First World War, and was again the scene of fighting between the It. invaders and the Albanians in Jan. 1941. Pop. 12,000.

Béraud, Henri (1835-), Fr. dramatic critic and author, b. Lyons, son of a baker. Was a silk-pattern designer and then a lawyer's clerk. His *Twenty Portraits of the French Revolution* contains vivid descriptions of Mirabeau, Saint-Just, Marat, Danton, Mme Roland, and Charlotte Corday, but is marred by a blurred historical background. In 1922 he won the Goncourt award for 2 books: *Le Virolier de Lune*, a political novel on the death of Louis XV, and *Le Martyre de l'obèse*, a humorous story.

Beraun, see **BEROUN**.

Berber, tn and prov. in the Sudan, near the junction of the Atbara and the Nile. The tn was the starting-point of the old caravan route across the Nubian Desert to the Red Sea, at Suakin. Pop. 5000.

Berbera, or **Berberah**, prin. harbour and tn in Brit. Somaliland, NE. Africa, on a bay of the Gulf of Aden. Pop. 15,000, which is nearly doubled during the cooler months from Oct. to May when an ann. fair is held.

Berberis, large genus of shrubs, about 450 species, chiefly found in Asia and S. America, of family Berberidaceae. Leaves simple, evergreen or deciduous, stems usually spiny; flowers solitary, umbellate, racemose, or paniculate, usually yellow in Asiatic species; orange in S. America. *B. vulgaris* is the common barberry (q.v.), found wild in Britain. Good garden

species are *B. aggregata*, *B. concinna*, *B. darwini*, *B. prattii*, *B. x rubrostilla*, *B. thunbergii*, and *B. wilsonae*.

Berbers, term applied to the different branches of the indigenous inhab. of N. Africa, who have inhabited the region between the Mediterranean and the Sahara since the earliest times. The derivation of the name is yet undiscovered, though it may have come from the Gk *barbaroi*, non-Greeks. Egyptian inscriptions of the 17th and 13th cents. do speak of the Barabara and Beraberata tribes. They were called Lebu, Mashuasha, Tamahu, Tehennu, and Kahaka by the Egyptians. There are a host of tribes called by this term to-day, the main sections being Zouaoua and Jobalia (in Tripoli and Tunisia), the Chauwia, Kabyles, and Beni-Mزاب (in Algeria); the



E.N.A.

A BERBER (KABYLE) OF ALGERIA

Shlûh, Amazigh, and B. (in Morocco); and the Tuareg, Amôshagh, Soryu (in the Sahara). The actual origin of the race is still obscure, and it is to be noticed that, notwithstanding the alterations in feature, usually brought about in the process of time by foreign conquest at the hands of successive invaders, the type is still surprisingly like that of the Stone Age. The usual facial characteristics are dark hair and hazel eyes, while the complexion marks them as a 'white' race. The Arabs have been the prin. invaders, and yet the races are almost as distinct as if some barrier had existed between them. In character the Berber is independent, sturdy, and self-reliant, honest, intelligent, and scrupulous. The gov. of the B. extends over each state, which in most cases is the vil. and there is no attempt at centralisation. Yet the poorest of them has as large a share in the gov. as the richest. They are warlike, and have never yet been thoroughly subdued. Their religion is Mohammedanism, though not strict. Berber women occupy an inferior position, and are procurable by purchase, and easily disposed of at will, yet they are protected by laws, and have a voice in making them. See G. Margais, *Les Arabes berbères du XI^e au XIV^e siècle*, 1913; P. Hacoun-Campredon,

Studies in the Evolution of Kabyle Customs, 1921; R. Millet, *Les Almohades: histoire d'une dynastie berbère*, 1923; also works on dialect: S. Bearnay (Rif dialects), 1917; Dostaing, 1920; Lacoust, 1920.

Berbice, E. co. of Brit. Guiana. It is bounded on the E. by Dutch Guiana and R. Corentyn. Its area is 16,920 sq. m. In 1831 it was joined to Essequibo and Demerara under one gov., while formerly it formed a distinct prov. Its chief products are rice, sugar, tropical fruit, cattle, mostly along the coast, bauxited kaolin, whilst greenheart wood and balata are to be found in the interior. The R. Berbice is fed by the Canje and is navigable for 100 m. New Amsterdam is the cap. Pop. 96,620.

Berceo, Gonzalo de (fl. 1230), Sp. poet, one of the earliest known poets in the vernacular. He was educ. in the Benedictine monastery of San Millán de la Cogolla, and became a priest. He followed the troubadour school of Langue d'Oc. His poems, mostly based on Lat. originals, are sacred in theme and are composed in single-rhymed Alexandrine quatrains. His most noteworthy poems are *Milagros de Nuestra Señora*, *Vida de Santa Prita*, *Vida de Santo Domingo de Silos*, and *La Historia de Santo Millán*.

Berceuse (from Fr. *berceau*), literally a cradle song; a soft lulling melody with an accompaniment to imitate rocking.

Berchem (or Berghem), Nicolas (1620-1683), Dutch landscape painter and etcher, b. Haarlem. Some of his best pictures are at Amsterdam. He d. at Haarlem.

Berchem, suburb of Antwerp (q.v.), Belgium. Pop. 46,800.

Berchem-Sainte-Agathe (Flem. Sint-Agatha-Berchem), suburb of Brussels, Belgium, 3 m. W. of the city. It has manufs. of chicory, ceramics, billiard balls, stoves, and gas-ranges. Pop. 13,200.

Berchta (the original of the Eng. Bertha), fairy in S. Ger. legend. She corresponds to Hulda (gracious, benign) in N. Ger. mythology.

Berchtesgaden, Ger. tn in the *Land* of Bavaria (q.v.), near the Austrian border, 74 m. ESE. of Munich (q.v.). It is in the Alps (q.v.), on the Untersberg, in a thickly wooded dist., and is overlooked by sev. majestic peaks: Watzmann (8820 ft); Hochkalter (8473 ft); and Hoher Göll (8196 ft). It was already known at the beginning of the 12th cent. for its monastery of Augustinian Canons; the monastery was granted the salt monopoly of the dist. in 1156; and in 1495 the priors of B. were made princes of the empire. The principality was secularized in 1803. The tn is now a health and winter sports resort. The salt-mines (which have a subterranean salt lake) still exist, and there is a porcelain factory. Pop. 26,000.

B. acquired new fame in modern times as the site of Hitler's (q.v.) mt retreat. Hitler (as well as Goering and Goebbels, q.v.) had here a large chalet in the middle of a compound containing barracks for some 20,000 troops. It was in

this chalet that Hitler received the majority of his guests; but intimate friends, or important foreign visitors whom he wished to impress, were invited to the fantastic 'Eagle's Nest,' or Berghof, high above the tn. The Berghof was a mushroom-shaped, solid stone structure, set squarely on the mt top, 6000 ft above sea level. It had 13 floors, of which 12 were underground and built into the core of the mt; from the valley the building looked like part of the mt. There were no bedrooms, but in the top storey a series of salons, from the great windows of which there were magnificent views over the valley below, and glimpses of the blue-green waters of the Königssee and of the foaming Salzach R. (in Austria). Hitler's reception room was octagonal in shape and 30 yds in diameter; the stone floor was covered with a superb Chinese carpet, in the centre of which stood an enormous octagonal table. Leading from this room there was a great rectangular banquet hall. In the underground storeys were the food and wine cellars, the guard-room, and the servants' bedrooms. The whole mt was honeycombed with passages and defence rooms, and the Berghof was protected by 5 rings of fortifications. Slave labour was used for all this immense construction, and the sordid wooden barracks in which the captives had lived stood amid the pine-trees on the hillside in sharp contrast to the luxury of the buildings which their labour had created. B. was taken by the troops of Gen. Leclerc's (g.v.) Div. on 5 May 1945. Previously the chalets of Hitler, Goering, and Goebbels, together with the surrounding camp, had been wrecked in allied air-raids. The Berghof itself survived the war, but was subsequently destroyed.

Berchtold, Leopold, Count (1758-1809), Ger. medical writer, who travelled through Europe, Asia, and Africa with a view to mitigating human suffering, and pub. works against hasty internment and concerning sicknesses incident to seamen. He pub. at Vienna, 1797, directions for the treatment and prevention of plague, and was active in making known the advantages of vaccination.

Berchtold, Leopold Antonius Johann, Count von (1867-1942), Austro-Hungarian minister and diplomat, b. Vienna. He entered the diplomatic service and in 1912 he succeeded Aehrenthal as foreign minister. At first he thought the dual monarchy's Balkan problems could be settled without war, but after the Balkan wars (1912-13) he became a convert to the belligerent solution. The assassination of Francis Ferdinand at Sarajevo gave his party in Vienna the opportunity they sought. There is little doubt from documentary evidence, that B. was a party to the conspiracy to hasten the ultimatum to Serbia in such circumstances that Serbia might not have time to offer satisfaction. His influence later declined, and he resigned in 1915.

Berck, Fr. seaside tn in the dept of Pas-de-Calais. It is in 2 parts: B.-Ville, a fishing port, and B.-Plage, a holiday and

health resort with a fine beach and clinics and sanatoria. Pop. 11,500.

Bercy, former Fr. com. situated on the r. b. of the Seine; it has been joined to Paris since 1860, and is the chief depot for the wines, oil, vinegar, and wood for Paris; boat-building is carried on.

Berdaches, see SHAMANISM.

Berdiansk, see OSIPENKO.

Berdichev, tn in the Zhitomir Oblast of the Ukraine, 116 m. SW. of Kiev. It is a local industrial centre. Pop. (1956) 47,000 (1914, 75,000), before the war mainly Jewish. B. has been known since the 14th cent.; in the 19th cent. it was the centre of Hassidism and was often called 'the Jerusalem of Volhynia.'

Berdyaev, Nicolai (1874-1948), Russian philosopher, b. Kiev. Early a revolutionary agitator and student of Marx, he attacked the anti-religious attitude of the Russian intelligentsia. After the revolution of 1917 he was elected by the faculty to the chair of philosophy, Moscow Univ., but was expelled in 1922 and settled in Berlin, where he founded the Russian Academy of Philosophy and Religion. Later he removed to Clamart, near Paris, where he remained till his death. Appointed to a lectureship at the Sorbonne, 1939. His first book, *Subjectivism and Individualism in Social Philosophy*, was pub. in 1901. He was at this time in strong sympathy with the revolutionary movement in Russia, and in 1907 he wrote an article in which he forecast the victory of the Bolsheviks in the revolutionary struggle. He was at issue with them, however, over the rights of human creativeness, and the freedom of the spirit to which he believed orthodox Marxism to be inimical. Therefore, although the revolution of Nov. 1917 was, in his view, 'inevitable and just,' a conflict arose between his social and his spiritual ideals, and he was expelled from the country in 1922. He remained an idealist thinker, and his philosophy of personalism had considerable influence on European thought. In a book written just before the Second World War, *Slavery and Freedom* (Eng. trans., 1944), he sought the way whereby man could free his creative personality from spiritual, economic, and political forms of bondage. He wrote as a Christian philosopher, and in *The Meaning of History* stated the Christian philosophy of hist. As a Christian apologist he sought to free religion from the objectivity and materialism into which it has fallen as a social force. Other works which have been trans. into English include *Freedom and the Spirit*, 1935, *The Destiny of Man*, 1937, *Solitude and Society*, 1938, *Spirit and Reality*, 1939, *Slavery and Freedom*, 1944, *The Russian Idea* (an interpretation of Russian thought as a whole), 1947, and *Towards a New Epoch*, 1948. He also wrote a scholarly and judicial account of the development of Communism under the title *The Origin of Russian Communism*, 1937.

Berdvansk, see OSIPENKO.

Bere, see BARLEY.

Bere Alston, see BERE FERRERS.

Bere Ferrers, tn and par. of S. Devon, England, 6 m. from Plymouth. In the par. is Bere Alston, which prior to 1832 was a parl. bor.; in the 15th cent. it had silver and lead mines. Pop. 2000.

Berea: 1. Ridge of hills overlooking Durban, Natal prov., S. Africa, forming part of Durban municipality.

- **Berea College**, non-sectarian co-educational institution situated in Madison co., Kentucky, U.S.A. Founded in 1855 to promote the spiritual and material welfare of the mt region of the S. It stands on a ridge of the Appalachians, 1075 ft above sea level. There were 1167 students in 1955.

Bereans, almost extinct sect of Christians founded in Scotland in the 18th cent. by the Rev. John Barclay (1734-1798) (q.v.). They are so called after the people of Berea, of whom it is said in Acts xvii. 11 that they received the word with all readiness of mind. The B. hold that the knowledge of the existence and character of God can be obtained from the Bible alone, not from nature or reason; that the Psalms of David refer to Christ alone; that assurance is of the essence of faith, and that lack of faith is an unpardonable sin. The rest of their doctrine is practically identical with that of the Calvinists. See CALVINISM.

Berengar I (or **Berenger** or **Berengarius**) (d. 924), King of Italy, 888-924, son of Eberhard, Duke of Friuli, and grandson of Louis le Debonnaire. Elected to the throne in preference to Guido, Duke of Spoleto, he maintained his position against all rivals until 923, when he was defeated by Rudolf, King of Burgundy. The following year he was assassinated.

Berengar II (d. 966), King of Italy, 950-61, grandson of Berengar I. In 952 the Emperor Otto I compelled B. to become a feudal dependant of Germany. In 961 B. was dethroned by the emperor, and d. in a Bavarian prison.

Berengaria (d. c. 1230), Queen of England, daughter of Sancho VI of Navarre. She married Richard I in Cyprus in 1191, and went with him to Palestine. She remained at Acre until Sept. 1192, when she left in advance of the king, and safely reached Sicily, and eventually France. She saw little of Richard after 1192, but may have been with him when he d.

'Berengaria', The liner, originally built for the Hamburg-Amerika line and launched in 1912 as the *Imperator*. After the First World War it passed to the ownership of the Cunard Steamship Co. It was at that time one of the fastest steamships afloat, and also one of the largest vessels to be fitted for liquid fuel. It was a turbine steamer with quadruple screws; gross tonnage, 52,226; 883 ft long, 98 ft broad, 57 ft deep; speed, 26½ knots. The B. was a favourite with the transatlantic traveller by reason of its speed, comfort, and luxurious equipment. One of its fastest transatlantic journeys was from Cherbourg to Ambrose Light in 5 days, 13½ hrs. The ship was retired from

service in 1936 after the inclusion of the new Cunard-White Star liner, *Queen Mary*, in the company's service.

Berenger (called **Berenger of Tours**) (998-1088), Fr. divine, b. Tours, of a rich and distinguished family. After studying at Chartres under Fulbert, he returned to Tours in 1031, and was made teacher in the monastery of St Martin. He continued to reside at Tours, though he was made archdeacon of Angers in 1040. B. agreed with the doctrine expressed by Scotus Erigena in the preceding cent., and openly taught it. He denied transubstantiation, and saw nothing but a symbol in the Holy Eucharist. He developed these views in a letter to Lanfranc, prior of Bec, and was condemned for them by the Councils of Verocelli in 1050, Tours in 1054, and Rome in 1059. He recanted, and burnt his documents expressing them, but later again went back to his heretical opinions. On being condemned by Rome, however, he repented, and finished his life as a rigorous ascetic.

Berenger de la Tour (d. c. 1550), Fr. poet, b. Aubenas. He studied law with the view of filling some post in the magistracy, but devoted himself mainly to poetry. His verse is characteristic for elegance and verve, if at times it shows a want of good taste. His works include *Le Siècle d'or*, 1551, *Chortide ou Louange du bal, aux dames*, 1556, *L'Amie des amies*, an imitation of Ariosto, 1558, and *L'Amie rustique*, with other poems and epistles, 1558—thus last a very rare and curious work.

Berenice, Macedonic form of *Phenice*, meaning Bringer of Victory: 1. One of the 4 wives of Ptolemy I, the founder of the dynasty of the Lagidae in Egypt, and the mother of Ptolemy II, called Philadelphus. B. had a son, Magas, by a former husband, who was afterwards King of Cyrene.

2. Daughter of Ptolemy Philadelphus by Arsinoë, the daughter of Lysimachus. She was the sister of Ptolemy III (Euergetes), and was given in marriage, 252 BC, by her father to Antiochus II, King of Syria, called Theos (God), who divorced his wife Laodice on the occasion. After the death of Philadelphus, Antiochus divorced B. and took back Laodice, who poisoned her husband and had B. murdered, together with a son whom she had by Antiochus. To avenge his sister's death, Ptolemy III (Euergetes), invaded Syria, put to death Laodice, and overran the empire of the Seleucidae.

3. B. II, wife (c. 248 BC) of Ptolemy III, daughter of Magas, King of Cyrene. On the eve of her husband's departure to invade Syria, B. dedicated a lock of her hair in the temple of Arsinoë-Aphrodite at Alexandria. This lock the court astronomer, Conon, soon after professed that he had discovered in the sky, transformed into a new constellation. The poet, Callimachus of Cyrene, wrote the poem about it, which is now only known from the beautiful trans. by Catullus, *De Coma Berenices*. B. was put to death

by her son, Ptolemy IV, and his infamous minister, Sosibius.

4. B. III, the only legitimate child of Ptolemy VIII, associated with her father on the throne, 88 BC; married Ptolemy IX (Alexander I), and after his death Ptolemy X (Alexander II), who immediately had her murdered, and was himself assassinated by the mob in consequence.

5. Daughter of Ptolemy XI (Auletes), and sister of the famous Cleopatra. During the absence of her father in Rome, B. was made regent, which office she held from c. 58 to 55 BC. Gabinius, about the close of 55 BC, came to Egypt with an army and restored Auletes, who put his daughter to death.

6. Daughter of Agrippa I. King of Judaea. She was married to her uncle, Herod of Chalcis, but after his death in AD 48 she lived, not without suspicion of incest, with her brother, Agrippa II. Married again, to the Cilician king Polimmon, she soon deserted him and returned to her brother, with whom she was living in AD 60 when St Paul appeared before him (Acts xxvi). In 75 B. followed Titus (q.v.) to Rome as his intended bride, but the match proving unpopular, he dismissed her on his accession in 79.

Berenice, seaport of ancient Egypt, situated on the W. coast of the Red Sea, S. of Ras Benâs. It was founded in 285 BC by Ptolemy II. It stands at the head of a gulf, and has been almost sanded up. Among its ruins is a temple.

Berenice's Hair, see COMA BERENICES.

Berenson, Bernard (1865-), Amer. historian and art critic; educ. Boston Lat. School and Harvard Univ. He became a foremost authority on It. painting and painters of the Renaissance, and in this connection his work on the Venetian painters was pub. in 1894, on the Florentine in 1896 and 1903, on the Central It. in 1897, and on the N. It. in 1907. Other works include *Lorenzo Lotto, an Essay in Constructive Art Criticism*, 1895, *The Study and Criticism of Italian Art* (3 series), 1901, 1902, 1916, *Essays on the Study of Sienece Painting*, 1918, *Three Essays in Method*, 1927, *Studies on Medieval Painting*, 1930, *The Italian Painters of the Renaissance*, 1932, *Italian Pictures of the Renaissance*, 1932, *Sketch for a Self-Portrait*, 1949, *Aesthetics and History*, 1950, and *Caravaggio—His Incongruity and Fame* (Eng. ed.), 1953.

Beresford, Charles William de la Poer (1846-1919), 1st Baron B. of Motemeh and Curraghmore, naval officer, son of the 4th Marquess of Waterford, b. co. Waterford, Ireland. He was educ. in private schools, and entered the navy as a cadet of the *Britannia* in 1859. He became lieutenant in 1868, captain in 1882, and rear-admiral in 1897. He was naval A.D.C. to the Prince of Wales (King Edward VII) on his visit to India (1875-1876), and to Queen Victoria (1896-7). He was in command of the *Condor* at the bombardment of Alexandria in 1882, when he distinguished himself for bravery; he served in the Nile expedition under

Lord Wolseley, 1884-5; he was in command of the naval brigade at the battles of Abu Klea, Abu Kru, and Metemneh, and commanded an expedition up the Nile to rescue Sir Charles Wilson's column. He was elected M.P. for Waterford, 1874-80; Marylebone, 1885-9; York, 1897-1900; Woolwich, 1902. He was appointed a lord commissioner of the Admiralty, but resigned in 2 years on a question of the increase of the fleet. He was in command of the Mediterranean Fleet, 1905-7, and of the Channel Fleet, 1907-9. He retired in 1911, in which year he was created G.C.B. He was raised to the peerage in 1916. His autobiography, *Memories*, was pub. 1914.

Beresford, James (1764-1840), author, b. Upham, Hants, and educ. at Charterhouse and Oxford. In 1812 he became rector of Kebworth Beauchamp, Leics. His chief work, *The Miseries of Human Life*, 1806-7, was praised by Scott.

Beresford, John (1738-1805), Irish statesman, b. Dublin and graduated at Trinity College in 1757. He sat in Parliament, representing Waterford, from 1760 till his death. He was made privy councillor, 1768; first commissioner of revenue, 1780; privy councillor of England, 1786. B. was Pitt's chief adviser in his Irish policy. B. suggested the clauses in Orde's Bill, regarding the removal of the commercial restrictions of Ireland, but was successfully opposed by Grattan (q.v.). Lord Fitzwilliam dismissed B. from office in 1795, on the ground that his influence in Ireland was displeasing to the Grattan party, and therefore a hindrance to the gov. Fitzwilliam was recalled on this account, and B. reinstated. B. was instrumental in bringing about the union of Ireland with England, and superintended the fiscal arrangements between the 2 countries. His second wife was Barbara Montgomery, one of the 'Graces' of Sir Joshua Reynolds's picture in the Royal Academy.

Beresford, John Davys (1873-1947), novelist, b. Castor, near Peterborough, son of the rector of Castor. Educ. at Oundle, he went to London at the age of 18, and was articled to a firm of architects. His first novel, *The Early History of Jacob Stahl*, 1911, was followed by *A Candidate for Truth*, 1912, and *The Invisible Event*, 1915, the remaining two novels of a trilogy. Although his themes are varied, he estab. a reputation as a writer of the realist school deriving from Gissing. He also owed much to the influence of Samuel Butler. In the same year as *Jacob Stahl* came the short novel, *The Hampshire Wonder*, a study of a small boy endowed with the most precocious intellectual gifts, and a highly original story. But in his preoccupation with abnormal psychology, B. tended to lose much imaginative power and, except for *These Lynnekers*, 1916, and *The Prisoners of Hartling*, 1922, his novels began to decline noticeably in artistic interest. Among his later books were his second trilogy, *The Old People*, 1931, *The Middle Generation*, 1932, and *The Young*

People, 1933. Besides novels he pub. sev. vols. of short stories, also a study of H. G. Wells, 1915, *The Case for Faith Healing*, 1934, and *What I Believe*, 1938. He collaborated in two plays and wrote a third, *The Compleat Angler*.

Beresford, Lord John George de la Poer (1773-1862), primate of all Ireland; Bishop of Cork and Ross, 1805; Archbishop of Dublin, 1820; Archbishop of Armagh, and Primate of all Ireland, 1822. In 1851 he was elected chancellor of the Dublin Univ., having been vice-chancellor since 1829. The cathedral of Armagh was restored through his liberality.

Beresford, William Carr, 1st Viscount (1768-1854), Brit. general, the illegitimate son of the 1st Marquess of Waterford. He entered the army in 1785 and served with distinction at Toulon, in Egypt, the Cape, and Buenos Aires. In Feb. 1809 he undertook the reorganisation of the Portuguese army and achieved great success. He was rewarded by being created a K.B. and a peer of Portugal. At Albuera he was in command, and he was also present at Badajoz, Salamanca, and other Peninsular battles. In 1814 he was made Baron, and in 1823 Viscount B. He left Portugal in 1822, entered into Eng. politics, and became master-general of ordnance in Wellington's administration, 1828-30.

Beresina, see **BEREZINA**.

Beretini, see **CORTONA**, P. DA.

Berezany (Polish Brzezany), tn in the Ternopol' Oblast of Galicia (q.v.), W. Ukraine, 30 m. W. of Ternopol'. It has the 16th-cent. castle of the Potocki family. Pop. (1930's), 17,000. B. had considerable trade in the 16th and 18th cents. It was the scene of a great battle in June 1917.

Berezina, right affluent of the Dnieper, in Belorussia; length, 280 m. It is memorable historically for the disastrous passage of Napoleon's troops in their retreat from Moscow in 1812. In the Second World War the Germans defeated large Soviet forces on the B. (1941).

Berezniki, Russian tn on the Kama, in the Molotov Oblast. It is one of the chief industrial centres of the Urals (vast chemical combine). Pop. (1956) 93,000 (1926, 16,000). It was founded in 1883 as a sodium plant, and absorbed Ussol'ye (founded in 1606, saltworks since the 16th cent.).

Berzovo, Russian settlement in the Tyumen' Oblast, W. Siberia. A pipeline is under construction from the natural gas fields near B. to Sverdlovsk. It was founded in 1593 as a fort, tn and administrative centre of the Lower Ob' area. It has been a place of banishment since the 18th cent.

Berg, Alban (1885-1935), Austrian composer; b. Vienna. He won recognition with his opera *Wozzeck*, which uses the twelve-note system of his teacher Schoenberg (q.v.) in a modified way. B.'s first pub. work was the piano sonata in B minor, 1908. He developed his later style in *Four Songs*, 1908, a string quartet, 1910, and *Three Orchestral Pieces* (Opus 6), 1914, a *Lyric Suite* for string quartet,

1926, a violin concerto, 1935, and the unfinished opera, *Lulu*. *Wozzeck* was written during 1914-20 and first produced at the Berlin State Opera in 1925.

Berg, Lev Semënovich (1876-), Russian zoologist and geographer of Jewish origin, b. Bessarabia. He has pub. many works on ichthyology, the physical geography of Russia, the origin of the loess soils, etc. His theory of 'nomogenesis,' an anti-Darwinist vitalistic theory of evolution, has attracted much attention. See his *Nomogenesis*, London, 1926, and *Natural Regions of the U.S.S.R.*, Washington, D.C., 1950.

Berg, see **STUTTGART**.

Berg, or Berg-Gladbach, former duchy of Germany, now part of the Land of N.-Rhine-Westphalia (q.v.). It lay on the E. bank of the Rhine (q.v.), and had for its boundaries Kleve on the N. and Cologne on the W. (q.v.). It became a duchy in 1380, when it was in the hands of the Jülich family. In 1815 the Congress of Vienna (q.v.) gave it to Prussia.

Berg Wind, name applied on the S. coast of Cape Prov. to a rough, hot, dry northerly wind. This wind is frequent during the months of May and Aug. Its duration is normally one day, but occasionally it blows steadily for 2 days.

Berga, Sp. tn in the prov. of Barcelona. Pop. 5800.

Bergaigne, Abel-Henri-Joseph (1838-1888), Fr. linguist and Sanskritist. In 1885 he was appointed to the chair (created for him at the Sorbonne) of Sanskrit and Comparative Grammar of the Indo-European languages. In his works he lucidly explained the theory of the unity of the Indo-European languages, and their relationship. Main works: *La Religion védique* (3 vols.), Paris, 1877-83; *Chronologie de l'ancien royaume Khmér*, 1884; *Manuel pour étudier la langue sanscrite*, 1884; *Études sur le lexique du Rig-Veda*, 1885; and *Manuel pour étudier le sanskrit védique*, 1890.

Bergamo: 1. Prov. of Italy, in central Lombardy (q.v.). The N. of the prov. is in the Alps (q.v.); the S. belongs to the great N. plain of Italy, and is watered by the Chero and the Serio, a trib. of the Adda (q.v.). In the E. is the W. shore of Lake d'Iseo (q.v.). The prin. tns include B. and Clusone (qq.v.). Area 1088 sq. m. Pop. 716,000.

2. It. city, cap. of the prov. of B., 25 m. NE. of Milan (q.v.). It stands at the foot of the Alps, between the R.s Brembo and Serio. It was once cap. of the Cisalpine Rep. (q.v.), and was the first seat of the republican gov. set up by Mussolini (q.v.) after his escape from custody in 1943 (see **ITALY, History**). The upper tn has ant. fortifications, a medieval cathedral, other fine old churches, and two 16th-cent. palazzi. The Accademia Carrara, in the lower tn, contains notable paintings. There is a school of music, and organs and textiles are manuf. Bartolommeo Colleoni (q.v.) was b. here. Pop. (tn) 99,500; (com.) 105,400.

Bergamot (*Citrus bergamia*), variety of

C. aurantium, the orange (q.v.). Essence of B. is an essential oil obtained both by pressure and distillation from the rind of the ripe fruit of the B. The essence smells of oranges, and is used as a perfume.

Bergara, see VERGARA.

Bergedorf, Ger. tn in the Land of Hamburg (q.v.), 8 m. SE. of Hamburg. It was the scene of a Fr. defeat by the Prussians in 1813. The dist. is called the *Vierlande* and is known for its vegetables, fruit, and flowers. Pop. 50,000.

Bergen (Belgium), see MONS.

warehouses, is still in use. Mariakirken, an old stone-built church, dates from the 12th cent., as does also the wooden stave-church at Fantøft. An explosion in the harbour in 1944 laid Bergenhus, seat of the Norwegian kings until the middle of the 14th cent., in ruins, but rebuilding has begun. The centre of the tn, around the wide Torvalmenningen street, has been extensively modernised. Old buildings worth preserving but which have to be removed under tn-planning schemes are now being re-erected at a site called 'Old Bergen' at Sandviken. Norway's



Norwegian State Railways

Bergen, second largest city and seaport of Norway, situated on the W. coast, in lat. 60° 23' N. The central part lies between Vågen Harbour and Puddefjord, but it has spread considerably in recent years. The vegetation is unusually prolific for that particular lat., and is accounted for by the heavy rainfall and the warm climate due to the beneficent influence of the Gulf Stream. B. was founded by King Olav the Peaceful in 1070, and for the next 200 years it was not only a leading commercial tn, but also a political centre and royal seat. From the 14th cent. the Hanseatic merchants estab. themselves in the tn and played an important part in the development of its commerce, so that it became one of the prin. trading ports of N. Europe. The tn, set amid the beauty of the surrounding 'Seven Mountains', is picturesque. Although ravaged many times by fire, much of the old town of white wooden houses has survived. 'Bryggen' (the 'Quay'), with its medieval

second univ., opened in 1946, is in B., as is also the Norwegian School of Economics and Business Administration. B. is also the national centre for oceanographical and marine biological research and fisheries administration. From the Middle Ages B. has been an important centre of culture. There are sev. good museums and art galleries, including the Museum of Arts and Crafts and the Hanseatic Museum. B. has its own National Theatre where Ibsen was manager for 5 years. B. was also the home of composer Edvard Grieg, in whose homage an International Festival of Music and Drama has been held annually since 1953. It was also the home of violin virtuoso Ole Bull, and Ludvig Holberg, the dramatist, was born there. The prin. export is fish and fish products; industry also includes shipbuilding and engineering. Since 1909 B. has been linked with Oslo by rail over the mts. An airfield for the city was opened at Flesland in 1955. Bergen is an important port of ingress for visitors from

abroad, and a leading tourist centre. It is linked with Newcastle by fast passenger liners crossing the N. sea sev. times weekly. Much of the important coastal shipping traffic for passengers and freight is based on B. Pop. (including the adjoining dists.) c. 150,000.

Bergen, see DOMINOS.

Bergen-op-Zoom, tn in the prov. of N. Brabant, Netherlands, at the junction of the R. Scheldt and the Zoom. It has large tile and pottery works, and the oyster and anchovy fishery is important. Sugar-beet is a new industry. In the 15th cent. its cloth trade and fisheries made it an important tn. Fortified in 1576, it was unsuccessfully besieged by the Spaniards in 1588, 1605, and 1622. It was more strongly fortified by Coehorn (q.v.), and was captured by the French in 1747, and again in 1795. Sir Thomas Graham (Lord Lynedoch) failed in the assault on the tn, 1814. The fortifications were destroyed in the 19th cent. Pop. 32,471.

Bergerac, Savinien Cyrano de (1619-55), Fr. writer, b. Paris. He served as an officer in the Guards, 1639-40; his enormous nose, his adventures, including a fight with a hundred opponents, and the duels which persisted throughout his life, are recorded by his friend Lebrét; he then turned to writing, producing (1654) *Le Pédant joué*, a comedy which influenced Molière, and the tragedy, *Mort d'Agrippine*, which the orthodox suspected of atheism. His satirical scientific romances *Histoires comiques des états de la lune*, 1654, and *du soleil* (pub. posthumously, 1661) have been regarded as the forerunners of Swift's *Gulliver's Travels*, or as an echo of Rabelais's *Pantagruel*. Edmond Rostand founded his play, *Cyrano de Bergerac*, 1897, on the adventures of the real Cyrano. See L. R. Lefèvre, *Cyrano de Bergerac*, 1927.

Bergerac, Fr. tn, cap. of an arron., in the dept of Dordogne, on the Dordogne. It was a Huguenot (q.v.) stronghold, and the revocation of the Edict of Nantes (q.v.) adversely affected its prosperity. It has distilleries and spinning mills, and trades in truffles, wine, and flour. Pop. 22,500.

Bergh, Johan Edvard (1828-80), Swedish painter, b. Stockholm. His paintings are chiefly landscape, and he was noted for representing idyllic moods of nature in Sweden. In 1861 he was appointed prof. in the Academy of Stockholm. His best picture is perhaps his 'View of Uri,' which went to Berlin.

Berghaus, Heinrich Carl Wilhelm (1797-1884), Ger. geographer, b. Clevés. In addition to many valuable geographical works, e.g. *Grundriss der Geographie*, 1842, his chief work is the great *Physikalischer Atlas*, 1838-48, new ed. 1886, by his nephew Hermann (1828-90).

Berghem, Nicolas, see BRECHERM.

Bergisch-Gladbach, Rhineland, Germany, see MÖNCHEN-GLADBACH.

Bergk, Theodor (1812-81), Ger. philologist, b. Leipzig. Appointed prof. of classical literature at Marburg; later at Freiburg and Halle. In 1868 he resigned

his chair, settled at Bonn, and devoted the remainder of his life to the study of Gk literature. He produced eds. of Anacreon, Sophocles, and Aristophanes; but his prin. works are *Poetae Lyrici Graeci*, 1843, and *Griechische Literaturgeschichte*, 1872-87, which was completed by Hinrichs and Peppmüller. See J. E. Sandys, *History of Classical Scholarship*, vol. iii, p. 146 (1908).

Bergler, Joseph (1753-1829), Ger. painter, b. Salzburg; sent to Italy, 1776, and studied in oil and fresco with Knoller, Mengs, Canova; obtained the prize at the Academy of Parma, 1784, with a picture of Samson delivered to the Philistines by Delilah. Returned to Germany, 1786, and painted many altar-pieces for churches in the neighbourhood of Passau.

Bergman, Hjalmar (1883-1931), Swedish novelist and playwright, b. Örebro, son of a wealthy banker. He frequently lived abroad, although much of his work was inspired by his native Örebro. His pessimism and realistic clarity of vision are tempered by humour, as in his novel *Clownen Jac*, 1930, or by irony and brilliant satire, as in *Markurello i Wadköping*, 1919. He was equally popular as a playwright (*Svechtenhielms*, 1925; *Patrasket*, 1928), and one of the few Swedish authors to compose genuine comedies. He also wrote scripts for films and radio. See R. G. Berg, H. Bergman, 1935, and E. H. Linder, H. Bergman, 1940.

Bergman, Ingrid (1917-), Swedish actress, educ. at the Lyceum for Flickor and the Royal Drama Theatre School, Stockholm. Her first Amer. film was *Escape to Happiness*, 1939. She made a series of films in Hollywood, including *For Whom the Bell Tolls*, 1943, and *Joan of Arc*, 1948, but during her marriage to It. film producer Roberto Rossellini she lived mainly in Italy. She won the Academy Award for the best actress of the year in 1944 (*Murder in Thornton Square*), and in 1957 (*Anastasia*).

Bergman, Torbern Olof (1735-84), Swedish chemist, b. Katrineberg, in W. Gothland. In 1767 he was appointed prof. of chemistry at Upsala. Notable for researches in dyes and on tungsten. His writings have been collected in 6 octavo vols., *Opuscula Torberni Bergmani Physica et Chemica*.

Bergmann, Ernst von (1836-1907), Ger. surgeon, b. Rügen, Livonia, Russia. In 1866 he was attached to Prussian troops in the hospital service through the Bohemian campaign and the Franco-Prussian war, and was appointed prof. of surgery at Dorpat, 1871-8. From 1878 to 1882 he was prof. at Würzburg, and then occupied the chair of surgery in the univ. of Berlin. In 1887 he attended the crown prince of Germany, afterwards Emperor Frederick III, who was attacked with cancer of the throat; this case gave rise to a controversy due to the different diagnosis of his colleague in attendance, the specialist, Sir Morell Mackenzie (q.v.). He was a pioneer in antiseptics. B. wrote numerous treatises, including *Die Lehre von der Fettleibigkeit*, 1863, *Die Lehre von*

den Kopfverletzungen, 1880, and *Die chirurgische Behandlung von Hirnkrankheiten*, 1888.

Bergmehl, or Mountain Flour, geological deposit in the form of very fine greyish-white powder, also called kieselguhr, fossil farina, and diatomaceous or infusorial earth. It is largely composed of the indestructible siliceous frustules or cell-walls of diatoms. Beds of earth of considerable thickness that have accumulated in past geological ages are now being found on the bottom of some freshwater lakes and on the sea floor. B. has valuable abrasive properties. It is employed in manufacturing dynamite as an absorbent; and is used as insulating material for boilers and steam-pipe coverings.

Bergner, Elisabeth (1898-). Ger. actress who made her reputation, in England, on her first appearance in Margaret Kennedy's *Escape Me Never* at the Apollo Theatre, 1933-4. Previously she had won early fame in Germany in *La Dame aux camélias*, and also in a Ger. rendering of Margaret Kennedy's *The Constant Nymph* and Shaw's *St Joan*. She played Rosalind at Stratford-on-Avon Shakespeare performances. Among her films were *Die Traumenden Munde* and *Catherine the Great*. In 1935-6 Sir J. M. Barrie wrote the play *The Boy David* especially for B.

Bergschund, mountaineering term for a crevasse between a glacier and the upper snow or ice slope of a mt peak. B.s are usually too wide to be strided, and resort must be had to a snow bridge.

Bergson, Henri Louis (1859-1941), Fr. philosopher, b. Paris. His father was a musician of Jewish birth; his mother was British. Although he spoke English fluently, his education was entirely French at the Lycée Condorcet and the École Normale. He held the post of prof. of philosophy at the Lycée d'Angers, 1881-1883, and after a number of similar appointments in the prov., he became prof. at the École Normale Supérieure, 1897-1900. In 1900 he was elected to a professorship at the Collège de France, holding the chair of philosophy there until 1921. In 1914 he was elected to the Académie Française, and in 1927 was awarded the Nobel prize for literature. His thesis, *Essai sur les données immédiates de la conscience* (Eng. trans. *Time and Free Will*, 1910), was delivered to the univ. of Paris in 1889, and won him immediate recognition. He was perhaps the first philosopher to recognise sufficiently the importance of change. His view was that much of the confusion in early metaphysics arose from the attempt to state reality in terms of *space* and to eliminate *time*. This attempted elimination of time is, he asserted, characteristic only of knowledge dominated entirely by conceptions of utility; and if the relation between knowledge and its objects is stated in terms of time instead of space, many antinomies, e.g. those of Idealism and Realism, will be resolved. Throughout his work, and particularly in *L'Évolution créatrice*, 1907. B. insisted on the

distinction between the nature of experience of time and that of experience of space: that time, properly understood, and freed from certain spatialising notions that have become entangled with it through the infirmities of thought, is a process of change in which none of the parts is external to another, but all are interpenetrating; where the past is carried on into the present; where therefore there is no repetition, but a continual creation of what is new—whereas space is that whose parts are external to one another and can be simultaneously apprehended, and in which recurrence of the same thing in the same position is possible. Like Heraclitus, B. regards everything as in a state of flux; ceaseless change in which there is, strictly speaking, no repetition or recurrence. There being no recurrence, there cannot well be any guiding rules of conduct to meet each new and unique contingency. His original aim, like that of many other philosophers, was to relieve himself of the oppressive chain of cause and effect, to assert free will as against mechanistic determinism. This he was able to do as a result of his meditations on time—reaching the conclusion that, despite the apparent progress of successfully predictive science, the future remains, not only unpredicted, but essentially unpredictable, because essentially uncertain. For B. there is a continual drama, of Life or Consciousness struggling against Matter and not conforming to its laws. At first, B. was purely dualistic on this question; but it was noticed that in *L'Évolution créatrice* he conceded something to the monistic tendency, and regarded matter as 'a vital impulse arrested.' This principle of the *élan vital* in evolution, the urge to create, was put forward by B. as an alternative to the Darwinian theory of natural selection, which, in his view, did not sufficiently explain the evolution of intellect. His theories had a profound influence on biological studies, and were corroborated by later developments in the study of psychology. His other works include *Matéire et mémoire*, 1896 (Eng. trans., 1911), *Le lître*, 1900 (Eng. trans., 1911), *L'Énergie spirituelle*, 1919, *Durée et simultanéité*, 1923, and *Les Deux Sources de la morale et de la religion*, 1932 (Eng. trans., 1935). See A. D. Lindsay, *The Philosophy of Bergson*, 1911; H. Wildon Carr, *Henri Bergson: the Philosophy of Change*, 1912; E. Hermann, *Eucken and Bergson*, 1912; Hugh S. Elliot, *Modern Science and the Illusions of Professor Bergson*, 1912; V. Jankelevitch, *Henri Bergson*, 1931.

Bergson, Thórir, see JÓNSSON, THORSTEINN.

Bergthórsson, Guðmundur (1657-1705), one of the foremost Icelandic poets of his time and after S. Breiðfjörð (q.v.) the greatest of all the *rímur* (q.v.) poets. The bulk of his work still awaits pub., but in 1947 the Icelandic Gov. and the Althing caused his *Olgeirs rímur dásaka* (Ogier the Dane) to be pub. and dedicated to Sir Wm Craigie. This cycle consists of 60 cantos and 4242 stanzas.

Bergues, Fr. tn in the dept of Nord, 5 m. SSE. of Dunkirk. Preserves are manuf. Pop. 3200.

Bergyt, or **Berguyt** (Norwegian *bergylta*), European name for the rose-fish, or *Sebastes marinus*, a fish of the family Scorpaenidae. It is found on both shores of the N. Atlantic, and is known by many names, amongst them being Norwegian haddock, red-fish, hemdurgan, red-perch, red-snapper. The grown fish is of a nearly uniform orange-red colour. The same name is used in Scotland for the black goby.

Berhampur, tn in Bengal, India, near Murshidabad on the Bhagirathi. The Indian mutiny broke out here. The old and abandoned tn of Cossimbazar is within the boundaries.

Beria, Lavrentiy Pavlovich (1899-1953), Georgian Communist, one of the most sinister figures of the Communist regime in Russia. He joined the Bolshevik party in 1917. From 1921 to 1931 he worked in leading positions in the Cheka and G.P.U. (q.v.) organs of Transcaucasia. From 1932 to 1938 he was first secretary of the Transcaucasian committee of the Communist party and virtual dictator of Transcaucasia. He was U.S.S.R. Commissar (Minister) for Internal Affairs, 1938-45; and 1941-53 also deputy prime minister in charge of security matters. In 1945 he was made a Marshal of the Soviet Union. B. ended the Great Purge (q.v.) by liquidating his predecessor Yezhov (q.v.), and many N.K.V.D. (q.v.) officials, and organised all the subsequent terroristic measures, including deportation of many hundreds of thousands from E. Poland, the Baltic States, and ters. formerly occupied by the Germans. He was also in charge of the security police in the satellite states of E. Europe. In the struggle for power after Stalin's death B. was defeated, arrested, and shot as an 'imperialist agent.' A confidant of Stalin, B. inaugurated in 1935 the Stalin-centred fictitious historiography which prevailed in the U.S.S.R. until the 20th Congress of the Communist party in 1956. See his *On The History of the Bolshevik Organisations in Transcaucasia*, London, 1939.

Beri-beri, disease due to dietary deficiency of vitamin B₁, or aneurin, the anti-neuritic vitamin (see VITAMINS). B. is mainly a disease of tropical and far E. countries where people feed on polished rice, i.e. rice which has had the vitamin-containing husk removed. B. also occurs in some parts of Europe and the U.S.A. under any conditions of dietary deficiency. It was prevalent in prisoner of war camps. Vitamin B₁ is found mostly in whole grain and cereals, yeast, kidney, liver, ham, and pork. Spaghetti and macaroni are lacking in B₁. The Japanese eradicated B. from the crews of their ships in 1881 by supplying unpolished rice in the place of the customary polished variety, but the significance of this empirical observation was not realised at this time. Sir F. Gowland Hopkins (q.v.) estab. in 1912 the presence of essential food factors in milk and yeast. Funk suggested 4

separate vitamins—anti-rickets, anti-scurvy, anti-B₁, and anti-pellagra—and his theory was subsequently verified. Fraser and Stanton in the Malay States proved that the cause of B. was the absence from the diet of a chemical substance found in the whole rice grain and the whole wheat germ. It was not until 1927 that efforts to isolate the anti-B₁ substance were successful, and the substance thus obtained was analysed by Jansen and Conath working in the Netherlands E. Indies. This substance was later identified with the vitamin B₁, or aneurin, the discovery of which was made independently by scientists working in the U.K. following the lead given by the work of Sir Gowland Hopkins. Aneurin was synthesised in 1937.

B. is usually insidious in onset, the symptoms being polyneuritis, with patchy areas of numbness, cardiac irregularities, weakness, and wasting. These symptoms are sometimes accompanied by oedema, when it is called wet B. Alcoholic polyneuritis is a form of secondary B., so called because the vitamin B₁ in the diet though not deficient is prevented from being absorbed as a result of damage to the digestive system by alcohol. A mild form of secondary B. may also occur during pregnancy.

Bering, Vitus (1681-1741), Dan. explorer; entered the navy of Peter the Great, and made sev. attempts to settle the question of the junction of Asia and America. On returning from one of these expeditions B. was taken ill and the expedition was obliged to spend nine months on an uninhabited is., afterwards called B. Is., where B. died shortly afterwards.

Bering Island is situated in SW. B. Sea. It is the most westerly is. of the Aleutian group. Bering (q.v.) was wrecked here, and, without food or shelter, d. miserably in 1741.

Bering Sea and Strait. The latter divides the continents of America and Asia, and also joins the N. Pacific with the Arctic Ocean. It is about 38 m. wide at its narrowest part, but is wider at the N. and S. extremities. There are numerous bays on either side of the strait, of which the waters are frozen over for sev. months in the year. B. Sea, which is sometimes called the sea of Kamchatka, is a part of the N. Pacific Ocean, and is situated between B. Strait and the Aleutian Is. It is the haunt of the whale, walrus, and fur seal.

Bering Sea Question, international dispute, between the govs. of the U.S.A., Great Britain, and Canada, connected with the unlicensed fishing of Canadian sealers in the Bering Sea. In 1886 certain Canadian sealers started on a business basis the hunting and killing of seals beyond the 3-mile limit in the Bering Sea, in which Great Britain had commercial privileges, granted by Russia in 1825. The gov. of the U.S.A. took steps to prevent Canadian fishing, and in 1892, by the Blaine-Pauncefote treaty, it was agreed that a court of arbitration should be held in Paris to settle the

question at issue. This court decided *inter alia* that the U.S. Gov. had no right of protection of property in seals beyond the 3-mile limit, and no exclusive rights of jurisdiction in the Bering Sea. The U.S.A. also paid a sum of £92,700 to the Canadian Gov. as a compensation for the ships she had unlawfully seized or damaged. Consult Stanton, *The Bering Sea Controversy*, 1892, and *Report of the Bering Sea Commission*, 1893.

Bériot, Charles Auguste de (1802-70), Belgian violinist and composer, b. Louvain; he married Malibran, the famous singer, who died in 1836; he was prof. in the conservatory of music of Paris, 1843, and of Brussels, 1843-52. He wrote a manual for the violin, composed 7 concertos and numerous other pieces. He had 2 noted pupils, Vieuxtemps and Léonard.

Beris, genus of dipterous insects of the family Xylophagidae. The species are small, metallic-coloured flies which frequent the leaves of plants, and the larvae feed on putrescent wood. *B. clavipes* lays its eggs in the form of a little chain of single oval eggs glued together.

Berlya, see BIERIA.

Berja, Sp. tn in the prov. of Almería. It manufs. paper and cotton, has a trade in wine, oil, and esparto, and there are lead-mines near by. Pop. 14,100.

Berkeley, name of an Eng. noble family, many of whose members had distinguished military careers, whose hist. centres round the tenure of the great castle at Berkeley, Glos, where Edward II was murdered. A clear descent can be traced from Robert Fitz-Harding, who d. in 1170, and was a wealthy citizen of Bristol. In 1165 he obtained a grant from the king of the manor of B. Thomas B. was summoned to Parliament in 1295, when the barony of B. was created. The earldom of B. was created in 1679. On the death of the 9th Earl of B. in 1810, an important and interesting lawsuit took place. In 1796 he had married a Mary Cole, by whom he had already had sev. children; his eldest son was declared illegitimate, but inherited B. castle and estates but not the title. He was, however, raised to the peerage as Baron, later Earl, Fitz-Harding; his brother who succeeded him was made a baron with the title of Fitzhardinge. The 3rd Baron d. without heirs in 1916. The earldom of B. remained in the legitimate branch of the family and became extinct in 1942. There have been many branches of the family, such as the Lords B. of Stratton (1658-1773), with which the philosopher George B. (q.v.) was connected.

Berkeley, George (1685-1753), Irish philosopher and bishop, b. near Dysert, Co. Kilkenny. In 1700 he entered Trinity College, Dublin, of which he became fellow in 1707. Here he studied Descartes and Newton, while Locke's *Essay*, pub. 1690, was already influencing the study of philosophy. The early trend of his mind is shown by his valuable *Commonplace Book* (1705-6), first pub. in 1871, which gives the first working out of his new principle in philosophy, viz.

that matter, substance, and cause have no meaning apart from the conscious spirit. In 1709 he pub. *A New Theory of Vision*, followed by a fuller statement in *Principles of Human Knowledge*, 1710. In 1711 appeared a *Discourse on Passive Obedience*. In 1713 Swift introduced him to the court and the intellectual society of London, and a popular exposition of his new theories in the form of *Dialogues between Hylas and Philonous* was pub. from 1714 to 1720 he travelled in Europe as chaplain to Lord Peterborough and as tutor to the son of Bishop Ashe. On his return, the disastrous condition of society, due to the collapse of the South Sea Bubble, led to his *Essay towards Preventing the Ruin of Great Britain*, 1721. In 1722 he was made dean of Dromore, and in 1724 dean of Derry. He then embarked on a scheme for the founding of a college in the Bermudas, to christianise from there the Amer. continent. Through Walpole he obtained a promised grant of £20,000, and in 1728 he went to Rhode Is., where he lived till 1731, returning when he realised the money promised would not be paid. In 1733 he pub. *Aliphron, or the Minute Philosopher*, a Platonic dialogue on the philosophy of religion, with criticism of the free-thinking of the age. B. was made Bishop of Cloyne, 1734. He pub. *The Analyst*, 1734, and *The Querist*, 1735-7, the latter a series of questions on sociology and economics. In 1744 was pub. his last work, *Siris*, which, nominally dealing with the use of tar-water as a specific in small-pox and other diseases, contains some of his most profound metaphysical speculations. In 1752 he resigned his bishopric and moved to Oxford, where he d.

B. is the direct successor to Locke, and much of his work consists of attempts to solve the problems that Locke had failed to solve. The central principle of B.'s philosophy was suggested to B.'s mind by an early study of Locke; and Kant has left it on record that he was awakened from his 'dogmatic slumber' by Hume's trenchant but not altogether accurate attack on B. B.'s *New Theory of Vision*, *Principles of Human Knowledge*, and the *Dialogues between Hylas and Philonous* (Everyman's Library, 483), although written before he was 30 contains, nevertheless, the main exposition of his philosophy. This main principle was that nothing existed apart from perception (*esse est percipi*), a principle which B. declared to be intuitively obvious and manifest common sense. But the *soldier* men of common sense among his contemporaries—including Dr Johnson—persisted in regarding B.'s doctrine, at best, as a subtle metaphysical paradox, at worst, as an ingenious sophistry. He was charged with attempting to prove the non-existence of matter, and that everything in the universe was merely ideal. B. protested against this assumption, asserting that everything that is seen, felt, heard, or in any way perceived, is a real being, i.e. exists, whilst, on the contrary, a thing which is not perceived cannot be

known, and, not being known, cannot exist. The only intelligible cause of all phenomena is a mind. Neither pain nor pleasure exist apart from their being felt. The complete works of B. have been ed. by A. C. Fraser (1871). See also G. Dawes Hicks, *Berkeley*, 1932, and J. Wild, *George Berkeley: a Study of his Life and Philosophy*, 1936.

Berkeley, Lennox (1903-), composer. He was educ. at Oxford Univ. and studied music in Paris. Much of his work is distinguished by a Fr. elegance and neatness, but he has also developed a more powerful style, especially in his opera *Nelson*, produced in 1954. Other works are a Symphony and *Sinfonietta*, concertos for piano, 2 pianos and flute, 2 string quartets, instrumental sonatas, piano works, songs, etc.

Berkeley, Miles Joseph (1803-89), botanist, b. Biggin Hall, Northants; educ. at Rugby and Cambridge. In 1880 he became rector of Sibbertoft. He was one of the earliest investigators on potato blight, grape mildew, and diseases of vegetables. His chief works are *Introduction to Cryptogamic Botany*, 1857, and *Outlines of British Fungology*, 1860.

Berkeley: 1. Tn in (Glos., England; situated in the Vale of B., a rich dairy and pasture country, once celebrated for its 'double Gloucester' cheese. The B. Ship Canal admits small vessels to Gloucester from the docks at Sharpness. The church is Early English and Decorated. B. Castle, where Edward II was murdered, to the SE. is one of the finest in England. Dr Edward Jenner, the discoverer of vaccination, was b. and buried here. Cloth was once manufactured. It was a bor. in the 13th cent., but the corporation was dissolved in 1885. Pop. (approx.) 1090.

2. Tn in Alameda co., California, U.S.A. It is a popular residential dist. for San Francisco, 7 m. distant across San Francisco Bay. It is the site of the univ. of California, Armstrong College, 4 divinity schools and state schools for the deaf and blind. It is largely residential, with an industrial water-front (industrial gases, soap, paint, chemicals, metal products). Pop. 113,805.

Berkeley Sound, opening on the NE. coast of E. Falkland Is.

Berkhamsted (Great Berkhamsted), urb. dist. and tn of Herts, England, 28 m. from London, on the Bulborne R., and near the old Grand Junction Canal. The grammar school dates from 1541, and the church of St Peter is of many styles and dates, chiefly Perpendicular. There are remains of the once important castle. Chemical manufs. form the chief industry; there are also manufs. of ladies' clothing and timber milling. Pop. 11,300.

Berkhamsted School for Girls, opened in 1888 at Berkhamsted, Herts, on the same foundation as B. School for Boys (founded in the reign of Henry VIII by Dean Incent of St Paul's, London).

Berkley, city in Oakland co., SE. Michigan, U.S.A., suburb of Detroit (q.v.). Incorporated as vil. 1924, as city 1932. Pop. 17,931.

Berkovitz, tn of Bulgaria, in Vratsa (q.v.) prov., at the N. side of the B. Mts, 38 m. NNW. of Sofia (q.v.). It has a ruined fortress, is in a fruit-growing dist., and has food-preserving and furniture industries. Pop. 7000.

Berkshire (A.-S. *Berroc-scir*, from the 'wood of Berroc where the box-tree grows'), co. of England, in the S. midlands, lying between Oxford and Bucks, N.; Hants, S.; Surrey, E.; and Wilts, W. The area is 454,725 ac. Pop. 427,300. There are 3 co. parl. divs.: Abingdon (N. div.), Newbury (S.), and Windsor (E.). Reading, the co. tn, returns 2 bor. members. The Thames forms the natural N. boundary, on which are situated the old tns of Abingdon, Wallingford, Maidenhead, Reading, and Windsor. In the NW. is the Vale of the White Horse, so called from the rude figure of a horse, 374 ft long, cut out of the chalk on White Horse Hill (856 ft). It is probably of far greater antiquity than Alfred's Dan. victory it is said to commemorate. Through the rich pastoral vale in which the Wantage runs the Ock. S. and E. are the valleys of the Pang, meeting the Thames at Pangbourne (near by is Bradfield College, estab. 1850), and of the Lambourn, draining to the Kennet, a beautiful trout-fishing stream, which runs to the Thames at Reading; on its SW. reaches lie Hungerford and Newbury. Near by are Inkpen Beacon (955 ft) and Walbury Camp (975 ft), the highest point in the co. Windsor Forest, the castle, and the tn are on the E. border, and SE., stretching into Surrey, are the sandy pine-clad heaths of Bagshot, where are Ascot and Wokingham, near which are the Royal Military College at Sandhurst and Wellington College. The co., except for Reading, is chiefly agric., sheep-farming on the chalk B. downs and dairying being of great importance. The B. breed of pigs is famous. See F. A. Brabant, *Berkshire*, 1911; Arthur Mee, *Berkshire*, 1939; R. P. Beckinsale, *Companion into Berkshire*, 1951; I. Yarrow, *Berkshire*, 1952.

Berkshire Hills, name given to the mt dist. of Berkshire co., Massachusetts, U.S.A. The scenery and healthy situation attract thousands of visitors annually; the mts are a continuation of the Green Mts of Vermont. The highest point is Greylock (3505 ft).

Berkshire Regiment, The Royal, 1st Batt. (formerly 49th Foot), was formed in 1714 in the W. Indies from independent companies which were regimented in 1744; it fought in the Amer. war of Independence and in 1782 became the Herts Regt. As marines it served in Baltic fleet in 1801. It took part in the Amer. war, 1812-14, the China War of 1840-2, and the Crimean War. In 1881 became the Berks Regiment, title 'Royal' being granted in 1885. 2nd Batt. (formerly 66th Foot) raised 1755; served under Wellington in the Peninsula. Garrisoned St Helena during Napoleon's captivity. During the First World War it raised 16 battalions for service in France, Flanders, Italy, and Macedonia. In the Second World War

the B. R. fought in France and Belgium and in Burma. They were the 56th (London) Div., and took part in the last stage of the Tunisian campaign, and in the allied landing in Salerno Bay on 9 Sept. 1943. The next month they crossed the Volturno and Garigliano, being engaged in battles fought over difficult terrain. Afterwards their div. was moved to the Anzio 'beach-head' (Jan.-Feb. 1944), and in Aug. of that year was moved to the Adriatic coast and thereafter took part in the thrust in April 1945 to the line of the Po. Another unit rendered conspicuous service at Mandalay in 1945. The B. R. is to be amalgamated with the Wilts Regiment by 1950.

Berlage, Hendrik Petrus (1856-1924), Dutch architect, *b.* Amsterdam, became a leader of the 'Modern Movement' in architecture. After being trained in Switzerland and travelling in Italy, he began practice in Amsterdam c. 1882, where his most important building was the New Exchange or Bourse, 1899-1903, which greatly influenced subsequent architecture throughout W. Europe.

Berlichingen, Götz von (1480-1562), Ger. knight of Swabia, the subject of Goethe's poem bearing his name (trans. by Sir Walter Scott). He went to war with his neighbours, and in 1513 was put under the ban of the empire for attacking Nuremberg; he was besieged by Maximilian the emperor, and *d.* in defence of his castle.

Berlin, Irving (1888-), Amer. songwriter, *b.* Russia; his parents migrated to the U.S.A. His songs include 'Alexander's Ragtime Band,' 'White Christmas,' and the scores for *Top Hat*, *Annie Get Your Gun*, *Call Me Madam*, etc.

Berlin, largest city of Germany, former cap. of Prussia (q.v.), and from 1871 until 1945 the cap. of the country. It is in the NE. of the country, on the R. Spree (q.v.), which flows through it SE.-NW. It lies entirely within the ter. of the Ger. Democratic Rep. (see GERMANY). At the end of the Second World War the city came under a 4-power occupation and was divided into 4 sectors: the Brit. sector, in the W., includes the dists. of Tiergarten, Wilmersdorf, Charlottenburg, and Spandau; the Amer. sector, in the E., the dists. of Kreuzberg, Neukölln, Schöneberg, Tempelhof, Zehlendorf, and Steglitz; the Fr. sector, in the NW., the dists. of Wedding and Reinickendorf; and the Russian sector, in the E., the dists. of Mitte, Friedrichshagen, Prenzlauer Berg, Pankow, Weissensee, Lichtenberg, Treptow, and Köpenick. On 30 Nov. 1948 the Russian representatives withdrew from the *Kommandatura*, and a separate municipal gov. was estab. in the Russian sector. The Brit., Amer., and Fr. sectors form an administrative unit called Western B. According to the constitution of the Federal Rep. (see GERMANY) B., in addition to being a city, is also a *Land* of the rep.; it is not yet formally incorporated as such. Western B. is governed by a House of Representatives, with 200 members, and a Senate. Its area is

186 sq. m., and its pop. (estimated 1955) 2,195,200. The area of Eastern B. (i.e. the Russian sector) is 156 sq. m., and its pop. (estimated 1953) 1,248,000.

Industries. The most important industry in Western B. is the electrical industry (in which 92,005 employees were engaged in 1955); steel and engineering, clothing, and chemical industries are also of great importance. There are large-scale manufs. of consumer goods, and of precision and optical instruments.

Education. The Friedrich Wilhelm Univ. of B., though not founded until 1810, came to hold a high place in European scholarship; among the famous names connected with it are Fichte, Hegel, Mommsen, Ranke, and Einstein (qq.v.). This univ. is now in Eastern B. A free univ. was founded in Western B. in 1948 (7635 students in 1955), and in Western B. there is also a technical univ.

Description. Since the end of the Second World War there has been a great deal of reconstruction in the Western sectors of the city; there has been less reconstruction in the Eastern sector, where the war damage was heavier. The most famous street of the pre-war city, the Unter den Linden (so called from its double avenue of lime-trees) is now in Eastern B.; it runs from the site of the old Imperial Palace (severely damaged in the war, and since razed) to the Brandenburg Tor (built 1789, a copy of the Propylaea at Athens), beyond which the Tiergarten and Western B. begin. The Tiergarten, covering 630 ac., is slowly recovering its reputation as one of the finest parks of Europe. Beside it still stands the ruined Reichstag, burned down in 1933 (see GERMANY, *History*). Through the centre of the Tiergarten runs the Charlottenburger Chaussee, on which stands the Stogessäule, a 151-ft column surmounted by a gilded Victory. The heart of Western B. is the Kurtürstendamm, running W. from the Tiergarten and the ruined Kaiser-Wilhelm-Kirche; it is an important shopping street, and in its neighbourhood there are other streets lined with post-war shops, offices, restaurants, and hotels: the Tauentzienstrasse, the Kautstrasse, the Joachimstalerstrasse, the Mehringdamm, and the Karl-Marx-Strasse. In the Dahlem quarter, towards the SW., is situated the new univ. (see under *Education* above), a botanical garden, and an ethnological museum. Near here is the beautiful forested area called the Grunewald, which is bordered on its W. side by the Havel (q.v.).

History. The nuclei of the city were the 2 small palaces of Kölln and B. on the arms of the Spree. Here another castle was built, which became a court of the Brandenburg (q.v.) Electors. In the time of Frederick William (q.v.), the Great Elector, and his successor these settlements were consolidated under the name of B. After the wars of Napoleon (q.v.) much of the city was rebuilt, mainly under the influence of F. Schinkel, but its rise to the position of a cap. city of the first importance dates from the

formation of the Ger. Empire. The city consequently grew with the expansion of trade and the centralisation of gov., and increased from a pop. of 826,000 in 1871 to 2,000,000 in 1905, and 3,000,000 in 1910. This growth in pop. meant that since 1878 the city was practically rebuilt. Sanitation, water supply, and public hygiene were reorganised, and overcrowding obviated by an extension of the city's boundaries. In 1911 a plan was carried out to bring the city and the towns of Charlottenburg, Lichtenberg, Neukölln,

local affairs was left to the districts, which had been absorbed. The municipal government covered schools, poor law, hospitals, water supply, drainage, lighting, etc. The city council consisted of paid and unpaid officials, and the elected common council was presided over by an *Oberbürgermeister* and a *Bürgermeister*. The police authority extended over building, markets, crime, and trade.

The old familiar provincialism of the city, which was dear in the eyes of many Germans, disappeared, and during the



D. McLeish

UNTER DEN LINDEN AND THE BRANDENBURG GATE IN 1939

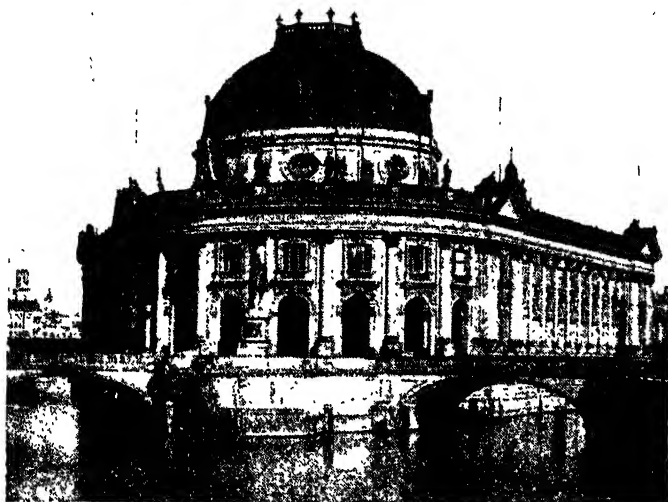
Schöneberg, Wilmersdorf, with the administrative areas of Teltow and Niederbarnim, under a common authority for the administration of streets, roadways, and the elevated railway. Common police regulations were to be in force in these places. Under the scheme large areas of land suitable for development were to be acquired. The scheme became operative on 1 April 1912, and functioned during the 1914-18 war, but after the armistice it was deemed desirable to effect further co-ordination in the municipal government and services. After protracted discussions between the different authorities concerned, a common basis of agreement was reached, and a Bill was passed in the Prussian Constituent Assembly on 27 April 1920, to establish a new municipality of B., which would take under its administrative aegis all the usual services and other matters of general application to the area as a whole; but a large measure of self-control in strictly

second decade of the 20th cent. the city became more European in character and less German. It was a formless city, never having been Germany's natural centre. It lay on the edge of the Reich, not only geographically but also historically and culturally. Under the Nazi regime a programme was laid down to make B. the focus of Ger. pride and the centre of Ger. culture as understood in the Third Reich. By this time B. already covered an area of 340 sq. m.—a larger area than that occupied by any other town in the world except Los Angeles—and as regards pop. it ranked fourth. The municipal authorities planned in the expectation that in a further 40 years B. would become the cap. of central Europe with a pop. of 10 million inhab. Greater B. was, in fact, almost a country in itself, stretching from Staaken to Schmokwitz, from Buch to Wannsee, and embracing within its area lakes, cornfields, and fir woods. With its fields

and windmills standing between its factories, B. served as a model of what the municipal authorities hoped the whole Reich would become in time.

In 1939 Germany entered upon a war, fully believing that its cap. city would remain invulnerable. Its leaders pledged themselves to this. The city became, however, one of the most heavily bombed of all the cities of Europe. Some of its severest trials under air attack came in 1943. In Jan. of that year it was bombed 4 times, including the first daylight raid,

manned by 5000 airmen, broke through a strong fighter screen and dropped 1700 tons of bombs on B. in 50 minutes, for the loss of 58 bombers and 1 fighter. Large-scale damage was done by this raid, especially to the central parts of the city, including the Mittelstrasse near Unter den Linden, the Wilhelmstrasse, and also the outlying industrial dists. of Siemensstadt and Spandau, while the railway stations, the Potsdamer, Anhalter, and Stettiner were ruined. Terrific damage was again wrought by the R.A.F. in



'The Times'

BERLIN: THE KAISER FRIEDRICH MUSEUM, 1939

which marked the beginning of the offensive of the U.S. Eighth Air Force. In Mar., with an improvement in weather conditions, the R.A.F. returned to the attack, and on 27 Mar. made a concentrated raid with a powerful force of 4-engined bombers carrying 900 tons of high-explosive and incendiary bombs. The sixth attack of the year was on 1 Mar., when a heavy concentric raid was made, lasting 30 minutes. Strong defences were encountered on the outskirts of the city. As a result of these raids various gov. depts were transferred to other cities, including the central offices of the Gestapo (q.v.) which were moved to Prague, and the foreign ministry, which was moved to Vienna, while the majority of the schools were evacuated to Lodz and Posen. By this time, also, about 500,000 of the inhab. were sent into Poland. On the night of 23 Aug. 1943, a strong R.A.F. force of 700 bombers,

attacks on the nights of 22, 23 Nov. 1943, the destruction being particularly great in the central dists. The whole way from the Potsdamer Platz, through the gov. quarters around Wilhelmstrasse, and towards the Tiergartenstrasse was a sea of fire and smoke. The Columbus Haus skyscraper was burnt out, the landmark Haus Vaterland, and the travel agency, Mitteleuropäisches Reisbüro, in the Leipziger Platz, were destroyed. The only building comparatively undamaged in the Wilhelmstrasse was the Reich Chancellery. The total losses also included the Hotel Kaiserhof in the Wilhelmsplatz, and the Ger. Foreign Office. By this time the Luftwaffe had been driven underground, and B. was a wrecked, cold, hungry city, in which food, fuel, and tobacco were bartered for clothing. But the largest force of R.A.F. bombers, chiefly Halifaxes and Lancasters, attacked the cap. on the night of 15 Feb. 1944, when more

than 1000 aircraft dropped 2500 tons in 30 minutes, while Mosquitoes followed them to hamper the work of B.'s fire brigades. The raiders lost 43 aircraft. Another big attack was made in co-ordination with the allied invasion of Europe when, on 21 June 1944, more than 1000 Flying Fortresses and Liberators of the U.S. Air Force, escorted by 1200 Lightnings, Thunderbolts, and Mustangs, bombed various targets in Berlin, for the loss of 43 machines. With the advance of the Soviet army, B. also became threatened from the land. By 21 Feb. 1945, Marshal Zhukov's (q.v.) forces were within 34 m. of the city. Air attack continued, the raid of 18 Mar. by a U.S. force of 1300 Liberators and Fortresses being the largest daylight attack B. had yet sustained. Over 3000 tons of bombs were dropped. On land the Amer. Ninth Army had reached the Elbe, 70 m. from B., on 11 April 1945. The same month the Soviet forces were fighting over the approaches to the city, and on 2 May the city surrendered to Marshal Zhukov. For further details of the Russian military operation against B., see EASTERN FRONT IN SECOND WORLD WAR.

About 75 per cent of the city was literally destroyed; 25 per cent of the buildings remained habitable, though dilapidated and partly damaged. In the central parts most buildings were gutted. Thus the Charlottenburger Chaussee from the Adlon Hotel to the former technical high school was burnt out. This was typical of the main arteries. In the Tiergarten only a few trees survived the bombs, the fires, and the shelling. On 2 May 1945 the city surrendered to Marshal Zhukov and was subsequently divided into 4 sectors (described above).

In 1948 the introduction of the W. Deutsche mark improved the situation for most Berliners. The ensuing Russian ban on rail, road, and canal movements from the W. into B., however, forced the 3 W. powers to supply essentials to the Western sectors by means of the now celebrated 'airlift.' The Russians eventually lifted the blockade late in 1949.

See A. Rutenberg, *Das alte Berlin*, 1913; J. Laforgue, *Berlin and its Environs*, 1923; E. Kaebler, *Berlin im Weltkrieg*, 1921, and *Erfahrungen und Erlebnisse aus dem alten Berlin*, 1917; Baedeker.

Berlin, tn, Coos co., New Hampshire, U.S.A. The falls of the Androscoggin R. provide the power for the large pulp, paper, fibre, and saw-mills. It is a winter sports resort. Pop. 16,615.

Berlin, Congress and Treaty of (June 1878), convention of the representatives of the chief European powers called to reconstruct the Russo-Turkish treaty of San Stefano (1878). The congress met under the presidency of Bismarck at B. Great Britain was represented by Lord Beaconsfield, Lord Salisbury, and Lord Odo Russell. By the treaty Rumania, Serbia, and Montenegro were recognised as independent states. The boundaries of Bulgaria were enlarged, and it became an autonomous Turkish trib. state under an elected prince. Rumelia also became

self-governing, under a Christian minister-in-chief, but was still held by the sultan. The boundaries of Greece were also enlarged. Bosnia and Herzegovina were transferred to the control of Austria. Rumania obtained the Dobruja, and in return ceded to Russia the Bessarabian ter. she took from Russia at the treaty of Paris. Ardahan, Kars, and Batum were ceded to Russia. Turkey agreed to a Brit. occupation of Cyprus.

Berlin, Pact of (1940), alliance between Germany, Italy, and Japan, signed in Berlin on 27 Sept. 1940. Its essential provisions were contained in the third article: after promising mutual respect for the new order (see NEW ORDER) in Europe under Germany and Italy, and the new order in 'Greater East Asia' under Japan, the 3 signatories undertook to 'assist one another with all political, economic, and military means when one of the 3 contracting parties is attacked by a power not at present involved in the European war or the Chinese-Japanese conflict.' Only 2 powers of the first rank came within this definition—Soviet Russia and the U.S.A. But the pact then went on to exempt Russia by the specific statement that the prevailing relations between that state and the contracting parties were not affected. The purpose of the pact was therefore to try to weaken the resistance of Britain by an alliance against the United States, and to limit the scope of the European war by raising a menace which might deter the U.S.A. from either active or even indirect intervention. Yet even if the U.S.A. should intervene in the Pacific, it was not clear how Germany or Italy could put forth any further effort in a form that could be of any real use to Japan; but if the U.S.A. should take positive action in Europe, Japan appeared to be committed to a declaration of war. Japan might reasonably have expected Germany to use her influence over the Vichy Gov. (see EUROPE, History; FRANCE, History) to facilitate her absorption of the whole of Fr. Indo-China, in which Japan already had a foothold. However, Hitler evinced but little concern to promote Jap. ambitions in the E., and Japan's pressure for a base at Saigon met with a rebuff from Vichy. One effect of the pact of Berlin was to decide the Brit. Gov. to reopen the Burma road on 18 Oct., thereby allowing munitions to find their way to the Chinese forces.

Berlin Spirit, potable spirit distilled from comparatively inexpensive material, such as potatoes and beetroot. It contains a large proportion of deleterious by-products, and is used for adulterating brandy and fortifying wines of poor quality.

Berlioz, Hector (1803–69), Fr. composer, b. near Grenoble, the son of a doctor; was trained for that profession, but broke with his family, and after many difficulties entered the Paris Conservatoire. He gained the Prix de Rome in 1830 with a cantata, *Sardanapalus*. His *affaires du cœur* were characteristic of his inborn romanticism and artistic associates, but apart from an idealistic love for a young

girl at home, Estelle Dubouff, nothing of the kind is known before his infatuation for Henrietta Smithson, the Irish Shakespearean actress. Almost crazed by her indifference, he consoled himself by turning to a pianist, Marie Moke, who afterwards achieved distinction as Mme Camille Pleyel. Having lost her, he seems in 1833 to have overcome Henrietta's opposition, but their marriage was unhappy and they separated in 1840, B. having an affair with Marie Rocio, a singer with whom he toured Europe. During this period he wrote the dramatic symphonies, *Épisode de la vie d'un artiste*;



BERLIOZ

Harold en Italie; *Symphonic funèbre et triomphale*, which contains a magnificent march for a military band; and *Roméo et Juliette*. From 1838 to 1864 he was musical critic for the *Journal des Débats*. His opera *Benvenuto Cellini* was refused a hearing in Paris, 1837. In 1846 he produced his most popular work, the symphonic cantata *La Damnation de Faust*. His sacred work include the *Requiem Grande Messe des Morts*, 1837, *Te Deum*, 1849, and the oratorio, *L'Enfance du Christ*, 1850-4. His last works were the operas *Beatrice et Bénédicte*, 1861, and *Les Troyens*, 1863. In 1842 he had first visited Germany, where, owing to Schumann's praise in the *Neue Zeitschrift für Musik*, he was received with enthusiasm by the new school, as he was later in Vienna and St Petersburg. He d. in Paris. B. was one of the prin. exponents of 'programme' music, but his fame will rest chiefly on his original mastery of orchestration, in which his romantic imagination found full scope. A great musician, he is one of the chief representatives of romanticism as well as

one of the originators of such new departures as the symphonic poem of Liszt and the *Leitmotiv* (q.v.) of Wagner. He was, above all, a marvellous inventor of orchestral sonorities. His faults, the results of impatience of discipline, have no doubt turned away many musicians, but these nevertheless not seldom profited from his discoveries. B. had the soul of a poet and his 'fiery romantic periods of genuine creation attained an admirable balance and transferred into the language of sound the harmonies brought to light by Virgil' (Henry Prunières). His *Traité d'instrumentation*, 1844, was ed. with additions by Richard Strauss, 1906. His *Memoirs and Letters* were pub. in 1870 and 1882; see selections, Eng. trans. in Dent's Everyman's Library. See also Alfred Ernst, *L'Œuvre dramatique d'Hector Berlioz*, 1884; J. G. Prod'homme, 'Unpublished Berlioziana' (*Music Quarterly*), April 1918. The standard life is by Adolphe Boschot (3 vols.), 1906-13; others by Adolphe Jullien, 1888; J. G. Prod'homme, 1923; W. J. Turner, 1934; T. S. Wotton, 1935; J. H. Elliot (Dent's Master Musicians series), 1937; G. de Pourfals, 1939; Jacques Barzun, 1950.

Berne, or **Berm** (Ger. *Berne*, edge of a field), technical term of fortification, both temporary and permanent. In the former kind of fortification it is the name given to an earthen mass which separates the parapet from the ditch, and whose function is to uphold the weight of the parapet in order to prevent it from causing the earth of the scarp to fall in. In permanent fortification the B. is a block of freestone which crowns the scarp and, projecting slightly over the ditch, serves the same function as the temporary B. When public works are in course of construction, the narrow passage between the canal or ditch and the earth which is excavated therefrom is called a B.

Bermejo, **Bartolomé** (active 1474-1494), Sp. painter, whose real name was Bartolomé de Cardenas, b. Cordova (it is supposed), worked in Aragon and Barcelona. He is the most outstanding of the early Sp. school and, though clearly influenced by the Flemish painters of his time, has a strong individual character. He painted a fine Pieta, 1490, for Barcelona Cathedral.

Bermejo, Rio, riv. of Argentine Rep., rising on Bolivian frontier and flowing SE. into the R. Paraguay. Much of its course is navigable by shallow-draught vessels. Total length, c. 650 m.

Bermejo Pass, see USPALLATA.

Bermondsey (meaning 'Beornmund's island'), parl. and metropolitan bor. of London, on the S. bank of the Thames, opposite the city of London and the bor. of Stepney. A rich Clunian priory, of which there are very scanty remains, existed here from 1089 until the Dissolution. On the riverside in the Middle Ages there were many hostleries and the in houses of the abbots of St Augustine, Canterbury, and of Battle, Sussex, and of the priors of Lewes, Sussex. Many Huguenots settled in B. after the massacre of St Bartholomew (1572), and are

credited with the foundation there of the leather industry. The prin. industries are leather and food manuf. and distribution. Rotherhithe (meaning a 'landing-place where cattle are shipped') was originally a separate vil. to the E. of B. It contains the Surrey Commercial Docks, begun in 1809, the largest timber docks in the world (460 ac.). The bor. has 3 tunnels under the Thames: the Thames Tunnel from Rotherhithe to Wapping, the Rotherhithe Tunnel to Shadwell, and a tunnel emerging near the SW. angle of the Tower of London used for water supply only. B. returns 1 member to parliament. Area 1503 ac.; pop. 58,000.

Bermudas, group of is. in the W. Atlantic Ocean, 32° 15' N. and 64° 51' W., 570 m. off Cape Hatteras, the nearest point on the N. Amer. coast. According to Juan de Bermudez, the Sp. navigator and historian, the B. were discovered at an earlier date than that of his own visit in 1515 but the exact date is unknown. In Peter Martyr's *Legatio Babylonica* there is a map, pub. in 1511, which shows the is. in an approximately accurate position. In 1609, when Admiral Sir George Somers's ship the *Sea Venture* was wrecked on a reef off the is., they were uninhabited. This reef was afterwards known as the Sea Venture Flat. Somers, who had escorted sev. other ships containing a body of settlers, d. the following year, and his companions, ignorant of the prior claims of Bermudez, named the is. after Somers. Reports of the fertility and beauty of the is. induced the Virginia Co. to petition for an extension of their charter so as to embrace the B. James I. granted their petition, but the company soon after sold the is. to a body called The Governor and Co. of the City of London for the Plantation of the Somers Is. In the ensuing two or three decades the is. were prosperous under the administration of this company, but later the settlers became subject to so many grievances and abuses that in 1679 they appealed to the Crown. A writ of *quo warranto* (q.v.) against the Bermuda Co. was successful and the administration was transferred to the Crown. The first General Assembly for the B. was held at St George in 1620, and when the gov. passed to the Crown, the commission to the first royal governor confirmed the grant of representative institutions. Geologically the is. are formed of aeolian limestone deposits and coral reefs, being the N. limit of the coral builders. There are some 300 is., of which all but 20 are small, uninhabited rocks, forming an oval ring lying NE. to SW. The total area is 20.58 sq. m. Great Bermuda, or Main Is., 14 m. long, contains the cap., Hamilton (q.v.); the only other tn is St George, the old cap. on St George Is., which, with Paget, Smith, and other is., encircles Carth Harbour, NE. of Main Is. At St George is the great floating dock. The islets of Ireland, Somerset, and others enclose the Great Sound at the SW. of Main Is. There being no streams or wells the is. are entirely dependent upon rainfall. The vegetation is nevertheless

prolific; the juniper or Bermuda cedar formerly grew in great quantities and is being restored after the blight which destroyed 80 per cent of the trees in the 1940's. The temperate climate, 63°-79° F., makes the B. a popular winter resort for Americans and Canadians, and there is a considerable export trade in early onions, potatoes, green vegetables, spring flowers, and lily bulbs to the U.S.A. Apart from tourism, agriculture is the chief industry, and it is entirely in the hands of small tenants. Arrowroot and bananas are grown, and there are extensive fisheries around the coasts. Locally manuf. essential oils and pharmaceutical products are now important exports; all meat, flour, and such necessities have to be imported. The former naval dockyard and station are being developed as a free port. A railway (2½ m.) connects Hamilton, Somerset, and St George, crossing the sea inlets or bays at a dozen points, but is now out of use; 426 steamships called at the colony in 1954. There are about 105 m. of colonial and 15 m. of military roads. The pop., excluding army and navy, is about 40,450, about 15,400 being white. The is. are a Brit. crown colony, administered by the Governor and Commander-in-Chief, an Executive Council (consisting of 3 official and 4 unofficial members), a nominated Legislative Council, and a House of Assembly (of 36 members, 4 members being elected by each of the 9 par.). The franchise was extended to women in 1944. The B. form an independent diocese under a bishop. Facilities for the setting up of naval and air bases on the E. coast of Bermuda and on the Great Bay were granted in Sept. 1940 to the Gov. of the U.S.A., and in 1944 a training base for ships of the Royal Canadian Navy was estab. Kindley Field is partly available for civil aircraft. There is a modern broadcasting station, transmitting on 2 wavelengths. See A. Hellprich, *Bermuda Islands*, 1889; W. B. Hayward, *Bermuda, Past, and Present*, 1923; H. M. Chapin, *Bermuda Privateers, 1625-1708*, 1925; also official reports, pub. biennially.

Bern (Fr. Berne): 1. Canton of Switzerland; area, 2658 sq. m. The fertile valleys of the Aar and the Emmen divide the mountainous alpine region in the S. from the Jura Mts in the N. Among the peaks of the Oberland are the Jungfrau, the Elger, the Schreckhorn, etc.; among the lakes of the canton are those of Thun, Brienz, and Biemme. The prin. riv. is the Aar (q.v.). The N. part of the canton is hilly; it produces corn, wine, and fruits. The SE. part, the Oberland, produces fruits in its lower valleys, and excellent pasturage higher up. Cows and horses are reared, the horses of Emmentaler specially being noted; the lakes abound in salmon and trout. Quarries of sandstone, granite, and marble are worked, and iron mines, whilst a little gold is also found. The manufs. of the canton, which are not extensive, comprise linen and woollen goods, leather, wood articles, and watches. The canton, which is made up entirely of lands acquired by the city B. at various

times, has a pop. of 838,500 (1955), mainly Protestants.

2. B., the cap. of the canton, and political cap. of the Swiss confederation, is situated on a high sandstone promontory, surrounded on three sides by the R. Aar. It is one of the best-built tns in Europe. There is a magnificent Gothic cathedral, dating from the 15th cent., a univ., the Federal Palace, a museum, and a public library. The streets in the old tn, flanked with arcades, are those of a prosperous 18th-cent. tn; the numerous fountains mostly date from the 16th cent. The chief industries are weaving, spinning,



Swiss National Tourist Office
ARCADES IN BERN, SWITZERLAND

and the manuf. of machinery and chocolate. B. also trades in cheese, wine, coal, and cattle. It has become the seat of sev. international institutions (postal, telegraph, railway, copyright). B. was founded in 1191, and became a free imperial city in 1218, and gradually attained a state of independence. Between 1288 and 1339 it successfully resisted attacks by Rudolf of Hapsburg, Albert his son, and Louis of Bavaria. B. entered the Swiss confederation in 1353 as its 8th member. In 1405 much of the city was destroyed by fire, but was rebuilt. In 1528 B. embraced the cause of the Reformation, and in the ensuing war with the Duke of Savoy added the Pays de Vaud to its dominions. From then till 1798 B. continued to prosper; in the latter year was overrun by the Fr. troops, and lost about half its possessions. In 1848 B. was made the political cap. of Switzerland. The origin

of the name of the tn is said to be from old Swabian *bern*, meaning a bear, and certainly a bear is represented on the first known tn seal, of the date 1224. Ever since 1513 bears have been kept in B. at the public expense, and the bear-pit is one of the sights of the tn. Pop. (1955) 156,100, mainly Protestants.

Bern Convention, see COPYRIGHT.

Bernadotte, Jean Baptiste Jules, see CHARLES XIV (of Sweden and Norway)

Bernalda, It. tn, in Basilicata (q.v.), 19 m. SSE. of Matera (q.v.). Pop. 5000.

Bernanos, Georges (1888-1948), Fr. novelist and polemic writer, b. Paris, of mixed Lorraine and Sp. descent. He contributed articles to minor periodicals and, at 38, took up literature as a career, his first novel being *Sous le soleil de Satan* (1926). His theme is almost always the struggle for the soul of man between the forces of good and evil, which he portrays with originality and intense conviction. In 1928 appeared *L'Imposture*, the portrait of the inner soul of an unbelieving priest, a masterpiece comparable with Duhamel's *Salavin*. In 1929 came the novel *La Joie*; in 1936 *Journal d'un curé de campagne*, trans. (1937) as *The Diary of a Country Parson*, which won him a European reputation. B., like Mauriac (q.v.), takes his stand upon the Rom. Catholic faith, and is a severe critic of fallen humanity. Other works: *Les Grande Cimetières sous la lune*, 1938, a polemic of remarkable power against Franco and his followers; *Nous autres Français*, 1939. B. went to Brazil in 1939 in voluntary exile, and there wrote *Lettre aux Anglais*, 1942. His last work was *Monsieur Ouine*, 1946, a complex work of fiction on his misgivings about the future of Christian civilisation. See A. Béguin, *G. Bernanos*, 1949.

Bernard (fl. 865), It. traveller in Palestine, called Sapiens, who has been confused with a Scottish monk of the same name. He set out from Rome, between 863 and 867, to Palestine, and on his return went to the monastery of Mont St Michael, in Brittany. To him has been attributed a work, *De Ipsa Urbe Hierusalem et de multis adjacentibus Locis*, and also a short tract, of which a MS. exists at Oxford and another in the Brit. Museum. Consult *Early Travels in Palestine* (Bohn's Antiquarian Library, 1847).

Bernard, Claude (1813-78), Fr. physiologist, b. near Villefranche; began the study of medicine in 1834 and worked with Magendie at the Collège de France, becoming deputy prof. in 1847, and succeeding him to the chair, 1855. His prin. researches and discoveries were in the digestive function of the pancreas, the sugar-making (glycogenic) secretion of the liver, and, perhaps his most epoch-making, the discovery of the vaso-motor system. His study of the action of poisonous drugs, chiefly curare, is also of importance. He pub. *Introduction à la médecine expérimentale*, 1866, and *Physiologie générale*, 1872; but his work is best judged by the 17 vols. of his lectures (*Leçons*); see his life by Sir M. Foster,

1899, and *Claude Bernard and the Experimental Method*, by J. M. D. and H. Olmsted, 1952.

Bernard, Edward (1838-97), oriental scholar and mathematician, b. at Towcester, Northants; 1855, elected scholar of St John's College, Oxford; studied Hebrew, Syriac, Arabic, and Coptic; 1869, Christopher Wren appointed B. his deputy in the Savilian chair of astronomy. B. supervised the reprinting of the old mathematicians. He d. at Oxford.

Bernard, Jean Jacques (1888-), Fr. playwright, son of Paul B. (q.v.); b. Enghien. His best plays are *L'Ami en peine*, 1921, *Martine*, 1922, and *L'Invitation au voyage*, 1924. In vivid contrast with the mockery and satire of the elder B., the younger's work is notable for penetrating psychology and is often concerned with the secret, almost inarticulate, purgatory of the soul. This is exemplified in *Le Feu qui reprend mal*, 1921, his earliest production.

Bernard, Montague (1820-82), lawyer, b. Tibberton Court, Glos. He studied at Trinity College, Oxford, of which he became a Vinerian scholar and fellow; he was called to the Bar at Lincoln's Inn, 1846. He was influenced by the High Church movement, and became one of the founders of the *Guardian*, 1846. He was appointed the first prof. of international law at Oxford, 1859-74. In 1871 he went to America, and was one of the high commissioners who signed the treaty of Washington.

Bernard, Paul (called Tristan) (1866-1947), Fr. author and dramatist, b. Besançon. He graduated in law and took a post first in an aluminium factory (1887-90) and then in the Court of Appeal, Paris. Later he was sports director at the Vélodrome Buffalo (1894-6); then editor successively of various papers, including the *Echo de Paris*, *Gil Blas*, *Journal*, *Auto*, etc. This varied experience of life is reflected in his plays and novels, his earlier work being vaudevilles of irony and mocking humour like *Le Fardeau de la liberté*, 1897, *Le Seul Bandit du village*, 1898, and *L'Anglais tel qu'on le parle*, 1899. The best of his later plays are *Triple Patte* (with André Godefraux), 1905, *La Peau de l'ours*, 1907, *M. Codoat*, 1908, *Le Petit Café*, 1911, and *Les Deux Canards*, 1913. His novels, which like his plays satirise human weaknesses, include *Mémoires d'un jeune homme rangé*, 1899, *Un Mari pacifique*, 1901, *Amants et voleurs*, 1906, *Deux amateurs de femmes*, 1907. See L. Trelch, *L'esprit de T. Bernard*, 1925.

Bernard-Beere, Mrs Fanny Mary (née Whitehead) (1856-1915), actress, b. Norwich; prepared for the stage by Hermann Veizin; first appeared at the Opéra Comique. In 1877 she joined the St James's company, London, taking the parts of Julia in *The Rivals* and Lady Sneerwell in *The School for Scandal*. She was engaged in 1883 by the Bancrofts for Sardou's *Fédora*, in which she scored a great success. In 1887 she became manager at the Opéra Comique, and produced *As in a Looking-Glass*, *Ariana*, and *Masks and Faces*. She appeared at

Wyndham's in *The End of a Story* in 1902, and at the Coliseum in *The Spy*, in 1905.

Bernard of Clairvaux, St (1090-1153), Cistercian monk, mystic, theologian, and statesman, b. of noble parentage near Dijon. He entered the recently established monastery of Cîteaux in 1112, and in 1115 was sent to found Clairvaux, of which he remained abbot until his death. B.'s life was one of almost incredible achievement, and he was indeed the embodiment of his age. During his rule no fewer than 68 houses were founded from Clairvaux; and without neglecting the spiritual guidance and temporal administration of his order he made long journeys upon affairs of state, advising popes, kings, and bishops. It was mainly due to his efforts that Pope Innocent II was able to overcome the anti-pope Anacletus and thus avoid a dangerous schism. He it was who inspired and preached the second crusade, and whose intervention brought about the condemnation of Abelard. He combined the most vigorous asceticism with extraordinary gentleness and charm, and even while he moved amid the intrigue and wrangling of courts he was raised to the highest summits of the spiritual life. B. was canonized by Alexander III in 1173; his feast is on 20 Aug. Among his voluminous writings are letters (ed. by B. James, 1955); a long commentary upon the Song of Songs in the form of discourses spoken in chapter at Clairvaux; the *De Consideratione*, a magnificent work addressed to Pope Eugenius III; and many other dogmatic and mystical treatises. See E. Gilson, *La Théologie Mystique de Saint Bernard*, 1934; B. S. James, *St Bernard of Clairvaux*, 1957; and Daniel-Rops, *Cathedral and Crusade* (Ch. III, Eng. trans.), 1957.

Bernard of Morlaix (fl. 1140), Fr. monk belonging to the Benedictine order. He was the author of *De Contemptu Mundi*, a poem which was pub. at Paris in 1843. It was complete in 3 vols., each containing 1000 stanzas, and has been widely read in a trans. by Neale.

Bernardin de Saint-Pierre, Jacques Henri (1737-1814), Fr. writer, b. Le Havre. He entered the army as engineer, and in 1765 returned to Paris, having previously visited Malta, St Petersburg, Warsaw, Dresden, and Berlin. From 1768 to 1771 he was gov. engineer in Mauritius. He was greatly influenced by the writings of Rousseau, his *Etudes de la nature* (3 vols., 1784-9) bearing witness to the fact. Before this he had pub. *Voyage à l'île de France* (2 vols., 1773), which gained him a reputation for its close portraiture of nature. But his masterpiece was *Paul et Virginie*, contained in the *Etudes*, a sentimental idyll of love set in Mauritius, followed by *La Chaumière indienne*, 1790. Both had great influence on Romantic literature by the new note of exoticism. See H. d'Almeras, *Paul et Virginie de Bernardin de Saint-Pierre: histoire d'un roman*, 1937.

Bernardines, name commonly applied to Cistercians (q.v.) of the Common Observance, as distinct from the Trappists who

follow the Stricter Observance. The nuns of this order have convents and schools at Slough, Bucks, and Westcliff-on-Sea, Essex. The male branch is not represented in England.

Bernardino of Siena, St (1380-1444), It. Franciscan friar, b. Massa di Carrara. Entered Franciscan order, 1404; appointed vicar-general, 1438. He restored the strictness of the early monastic rule, was famed as a preacher, and wrote sev. mystic works. He founded the *Frates de Observantia*, a branch of the Franciscan order, numbering over 300 monasteries in Italy in his own times. B. was canonised as a saint, 1450. His writings were pub. in Venice c. 1594, again in 1745, and in Paris in 1836. See *Mary Alles, Three Catholic Reformers*, 1870.

Bernau, Ger. tn in the dist. of Frankfurt-on-Oder, 48 m. NW. of Frankfurt (q.v.). It has textile industries, and was once noted for its beer. Pop. 13,000.

Bernauer, Agnes (fl. c. 1432), daughter of a poor barber-surgeon of Augsburg, was married secretly to Albert, eldest son of Ernest, Duke of Bavaria-Munich, in 1432; banned from a tournament by his father for his apparent illegal connection with Agnes, Albert openly acknowledged her as his wife, but in his absence she was charged with witchcraft, condemned, and drowned in the Danube. One of Heibel's prin. tragedies, *Agnes Bernauer*, 1855, is based on the story, and Otto Ludwig left an unfinished play on the same subject.

Bernay, Fr. tn in the dept. of Eure, on the Charentonne, 31 m. from Evreux. The abbey, round which the tn grew, was founded in the 11th cent. The tn was taken by the English sev. times in the 14th cent. A great fair for Normandy horses is held annually in Lent, and there are millinery, leather, metal, and chemical manufs. Pop. 8200.

Bernays, Jakob (1824-81), Ger. philologist and philosopher, b. Hamburg of Jewish parentage; educ. at the univ. of Bonn. He was prof. of classical philology at the Jewish Theological College, Breslau, from 1853 until 1866, in which year he returned to Bonn as extraordinary prof. and librarian. The majority of B.'s works deal with the Gk philosophers.

Bernburg, Ger. tn in the dist. of Halle, on the Saale (q.v.), 23 m. NNW. of Halle (q.v.). It was once the cap. of the Duchy of Anhalt-B. There is a 14th-cent. castle, and there are manufs. of machinery and sugar. In the dist. there are potash and salt-mines. Pop. 54,000.

Berne (Switzerland), see **BERN**.

Berners, Gerald Hugh Tyrwhitt-Wilson, 14th Baron (1883-1950), musical composer and novelist. Educ. at Eton, he was in the diplomatic service from 1909 to 1924. Among his musical works are an opera, *Carrosse du Saint Sacrement*, 1923, and a number of ballets, including *Triumph of Neptune*, 1926, *A Wedding Bouquet*, 1937, *Cupid and Psyche*, 1939, and *Les Strénes*, 1946. His novels include *The Camel*, 1936, *Far from the Madding War*, 1941, and *The Romance of a Nose*, 1942, and he also pub. two popular

autobiographical works, *First Childhood*, 1934, and *A Distant Prospect*, 1945.

Berners, John Bourschier, 2nd Lord (c. 1469-1533), translator, son of Sir Humphrey B. (a descendant of Edward III), who was killed at the battle of Barnet, fighting for Edward IV. John was sent to Oxford at an early age. Henry VIII made him chancellor of the exchequer for life; he was also made governor of Calais, where he d. At the king's command he trans. the *Chronicles of Froissart*, 1523-5, the work being printed by Pynson, *The Golden Book of Marcus Aurelius*, 1534, *History of Arthur of Llyell Brytaine* (Brittany), and the *Romance of Huon of Bordeaux*. He also wrote a comedy called *Ite in Vineam meam* (Go into my vineyard).

Berners, or **Bernes**, or **Barnes**, Juliana (c. 1388-), writer on sport, was said to be the daughter of Sir James B. and to have become prioress of Sopwell Nunnery near St Albans. The *Boke of St Albans*, 1486, has been attributed to her, but she was probably author only of the treatise on hunting contained in it. See facsimile of the *Boke of St Albans*, ed. W. Blades, 1881.

Bernese Oberland, strictly the upper country or 'highlands' in the S. of the canton of Bern, Switzerland, but often extended to include the range of the Alps from the upper Rhône valley northwards, and from the lake of Geneva to the lake of Luzern, thus lying also in parts of Valais, Vaud, Fribourg, Luzern, Uri, and Unterwalden. It is the most frequented of Alpine dists. by tourists and visitors, both in summer and winter. The chief centres from which expeditions are made are Thun; Interlaken, 17 m. by rail from Thun; Schynige Platte; Lauterbrunnen; Murren; Grindelwald, one of the most frequented resorts in Switzerland; Meiringen, the meeting-place of many routes; and Kandersteg. The prin. peaks of the B. O. are the Finsteraarhorn, 14,025 ft; the Aletschhorn, 13,721; the Jungfrau, 13,670 (the splendid view from Interlaken is famous); Mönch, 13,468; Schreckhorn, 13,386; Gross Vischerhorn, 13,285; Elger, 13,042; the three peaks of the Wetterhorn, 12,166, 12,149, and 12,110. The views from the Sparrhorn, 9928, Eggishorn, 9626, are well known. The highest passes are Lauthor, 12,140, Mönchjoch, 11,680, and Jungfrauojoch, 11,385, leading to the Eggishorn from Lauterbrunnen, Grindelwald, and the Vengern Alp respectively. The Gemmi, 7641, leads from Kandersteg to Leukerbad, the Grimsel, 7100, with a carriage road, from Meiringen to the Rhône glacier, and the Great and Little Scheldeggs, 6434 and 6788, from Grindelwald to Meiringen and Lauterbrunnen. The 3 largest glaciers in the Alps are in the B. O., viz. the Great Aletsch, 12 m., the Unteraar, and the Fiescher, 10 m.

Bernesque Poetry (*poesia bernesca*), see **BERNI**, FRANCESCO.

Bernhard of Saxe-Weimar, Duke (1604-1639), Protestant general of the Thirty Years War, youngest son of John, 3rd Duke of Saxe-Weimar. At the beginning

of the war he was present at the defeats of Wiesloch, Wimpfen, and Stadtlohn, 1622-3. He joined Christian IV's Dan. army in 1625, and later rose to high rank in the army of Gustavus Adolphus. His leadership in command at Lützen, 1632, after Gustavus's death, and his successful invasions into Germany and Bavaria, made him the most formidable opponent of the Imperialists. In 1633 he captured Regensburg, but was crushingly defeated by Gallas at Nördlingen in 1634. On the entry of France into the war he took service with her, still being general in command of the Protestant forces. His campaign of 1638 was successful with victories at Rheinfelden, Wittenweither,

company and made her first marked successes as Zanetta in Coppée's *Le Passant*, 1869, and as the queen in Hugo's *Ruy Blas*. Returning to the Comédie Française after the Franco-Prussian war, great performances in the title role of Racine's *Phèdre*, 1874, the test part of Fr. tragedy, and as Doña Sol in Hugo's *Hernani*, 1877, proclaimed her as the successor to Rachel's vacant place on the Fr. stage. She made her first appearance in London with the Comédie Française at the Gaiety Theatre in 1879. In 1880 she broke with the Comédie Française on the production of Augier's *Les Avenisseurs* and had to pay heavy damages. She began her triumphal tours of the world,



Swiss Federal Railways

INTERLAKEN AND THE JUNGFRAU (13,699 ft) FROM THE NORTH

and Thaur, and the capture of one of the strongest fortresses in Europe, Breisach.

Bernhardi, Friedrich von (1849-1930), Ger. soldier and author, b. St Petersburg (Leningrad), where his father was at the Ger. embassy. He entered the army in 1869, and fought in the Franco-Ger. war; later became military attaché at Bern, and was appointed a general of cavalry in 1908. He retired in 1909, and wrote *Germany and the Next War*, 1912, a complete and undisguised exposition of Pan-Germanism and the Ger. ideal of *Weltmacht*. B. may be regarded as a disciple of Nietzsche and Troitschke, but went far beyond them in his frank proposal of the ruthless means for attaining the end of immediate Ger. world dominion.

Bernhardt, Sarah (1845-1923), Fr. actress, b. Paris, 23 Oct., of a Jewish family named Bernard, the 11th of 14 children. She was baptised with the name of Rosine and was brought up in a convent school at Versailles. After gaining prizes for tragedy and comedy at the Conservatoire she appeared in a small part in Racine's *Iphigénie* at the Comédie Française in 1862; in 1867 she joined the Odéon

appearing principally in Scribe's *Adrienne Lecouvreur*, Dumas fils's *Dame aux camélias*, and Meilhac and Halévy's *Frou-Frou*. Sardou's plays *Fédora*, *Théodora*, *La Tosca*, and *Cléopâtre* were specially written round her emotional and magnetic personality. These, with Richepin's *Nana*, *Sahib* and Barbier's *Jeanne d'Arc*, were her chief successes during her occupancy of the Porte St Martin theatre (1883-90). During these years, and from 1891 to 1893, she visited not only the chief towns of Europe and the U.S.A., but also Australia and S. America. She moved to the Renaissance Theatre in 1893 with Jules Lemaitre's *Les Rois*, where she also played in Sardou's *Gismonda*, 1894. In the first of Rostand's poetic dramas, *La Princesse lointaine*, 1895, she created the part of Méliande, to be followed by Photine in the same author's religious drama, *La Samaritaine*, 1897. Her appearance in *Magda*, 1895, a Fr. trans. of Sudermann's *Heimat*, marked a new departure, to be followed (1899) by her impersonation of Hamlet, a doubtful though daring experiment. She repeated the impersonation of male character as the hapless

Duke of Reichstadt in Rostand's *L'Aiglon* in 1900 at the Théâtre Sarah Bernhardt. Gifted with a wonderful voice, which could range over every note of human passion, and with a vivid personality, the 'divine Sarah' represented at its highest the emotional as distinct from the intellectual type of actress. To compare her playing with that of Eleonora Duse in such parts as *Magda* or the *Dame aux Camélias* is to realise the creative powers of two actresses of distinct schools of art. She married, in 1882, a member of her company, M. Jacques Damala, a Greek, from whom she separated in the following year. There was one son, Maurice B. As a result of an accident, her right leg—including the thigh—was amputated in Paris, 22 Feb. 1915. Nevertheless she continued to act, and toured in America, 1917. In London, April 1921, she played a man's part in Verneuil's *Daniel*. In 1913 she had received the Cross of the Legion of Honour; she became officer in 1921. Her life has been written by Jules Huret, 1889, Sir G. Arthur, 1923, and M. Baring, 1933. See also her autobiography, *Ma double vie*, 1907 (Eng. trans. 1908).

Bernhardy, Gottfried (1800–75), Ger. philologist, b. Landsberg, Brandenburg; was prof. at Berlin Univ., 1825–9, and afterwards prof. in Halle Univ. and director of the Philological Seminary. His works include *Grundriss der römischen Literatur*, 1830, *Grundriss der griechischen Literatur*, 1836–45, and an ed. of *Suidas* (4 vols.), 1834–53.

Berni, Francesco (1497–1535), It. comic poet. His popularity is evidenced by the fact that since his time burlesque poetry is referred to as *poesia bernesca*. Having held a secretaryship at Rome, he gladly renounced what was to him a drudgery for a canonry in the cathedral of Florence. His fame rests largely on his complete revision of Bolardo's *Orlando Innamorato*, which was the basis of Ariosto's masterpiece, *Orlando Furioso*. His witty, graceful verse forms a pleasant contrast to the unpolished lines of Bolardo.

Bernicia, A.-S. kingdom, from the Tyne to the Forth; the first king was Ida, 547–559, and his cap. Bamburgh. In 605 Ethelfrith united the S. independent kingdom of Deira with B. as one kingdom, Northumbria. The see of the bishopric of B. was at Lindisfarne and later at Hexham. See NORTHUMBRIA.

Bernicle, see BARNACLE.

Bernier, François (1620–88), Fr. traveller, b. Angers in Anjou; took the degree of doctor at Montpellier; he set out on his travels in Palestine and Egypt; left Egypt and went to India, and was physician for 8 years to the Mogul Emperor Aurangzebe. He wrote on his return to France a *History of the Empire of the Great Mogul*, which appeared in 1670, and a continuation of this the next year; they were reprinted under the title of *The Travels of François Bernier*, and have been trans. into all European languages.

Berdina, name of a mt. Piz B., 13,304 ft. and of a pass, 7645 ft. in the Rhaetian

Alps, canton of Grisons, Switzerland. The pass, over which there is a carriage road and a railway line, leads from Pontresina, Upper Engadine, to Tirano in the valley of the Adda, Italy. The B. Alps form a group lying between the Maloja and the Reschen Scheideck passes. The Piz B. was first climbed in 1850. The longest cable railway in Switzerland, covering 2½ m. from B. Häuser on the pass (6720 ft.) to Diavolezza (9770 ft.), was opened in 1957.



Anderson

BERNINI'S 'APOLLO AND DAPHNE'

Bernini, Giovanni Lorenzo (1598–1680), It. architect and sculptor, was, with Borromini (q.v.), the leading exponent of the Baroque style in Rome. As a boy, his skill as a carver had attracted the notice of a cardinal, who introduced him to the papal court; and throughout the remainder of his long life he worked for popes and cardinals in transforming Rome. His chief buildings in Rome were the completion of St Peter's, including the baldacchino over the high altar, and the magnificent colonnaded piazza, 1629–1667; the church of S. Andrea al Quirinale, 1678; and sev. beautiful fountains. Famous among his somewhat theatrical but marvellously competent sculptures,

are the 'Apollo and Daphne' in the Borghese Gallery, and the 'Ecstasy of S. Teresa' in the church of S. Maria della Vittoria, both in Rome. See biographies by M. Raymond, Paris, 1911, and R. Wittkower, 1955.

Bernoulli, or **Bernoulli**, name of a family of mathematicians and scientists. Originally residents of Antwerp, they were driven by the persecution of the Spaniards to find refuge first in Frankfurt, and afterwards in Basel:

Jacques, or **Jacob** (usually called **James** by Eng. writers) **Bernoulli** (1654-1705), *b. Basel*, was esteemed in his own day as a versifier in Latin, German, and French. He taught himself the elements of geometry against his father's wishes, and from 1676 to 1682 travelled in France, England, and Holland. In 1687 he was appointed to the chair of mathematics at Basel, where he remained until his death. He solved Leibnitz's problem of the isochronous curve, and determined the curve formed by a chain hanging between two supports and the curve formed by an elastic rod supported at one extremity and bent by a weight at the other. His *Ars Conjectandi*, dealing with the theory of probabilities, was pub. in 1713.

Jean Bernoulli (1667-1748), *b. Basel*, was aided by his brother **Jacques** in his early mathematical studies, but has achieved a higher reputation as an independent discoverer. He became prof. of mathematics at Groningen, and after holding the position for 10 years, succeeded his brother in 1705 in the chair of mathematics at Basel. His works are numerous and important, and amongst his discoveries was that of the exponential calculus. Three of his sons achieved distinction in mathematics.

Nicholas Bernoulli (1695-1726), son of the preceding, *b. Groningen*, was appointed prof. of mathematics at St Petersburg, but was drowned after holding the office for about 8 months.

Daniel Bernoulli (1700-82), brother of the preceding, *b. Basel*, studied medicine as well as mathematics, and in 1725 was appointed prof. of mathematics at St Petersburg. In 1733, disturbed by the state of his health, he returned to Basel and occupied the chair of anatomy and botany. His work was concerned mainly with the problems of hydro-dynamics and the theory of probability in relation to the practical issues of life.

Jean Bernoulli (1710-90), third son of Jean B., *b. Basel*, studied in France, and became prof. of eloquence in Basel. He succeeded his father in the chair of mathematics in 1748. On three occasions he received the prize of the Academy of Sciences at Paris, his subject being the capstan, the propagation of light, and the magnet.

Jean Bernoulli (1744-1807), son of the preceding, *b. Basel*, became astronomer royal at Berlin at the age of 19, and subsequently held the office of director of mathematical studies at the academy of Berlin.

Jacques Bernoulli (1759-89), brother of the preceding, *b. Basel*, studied law, but

could not be restrained from his natural enthusiasm for geometry and also experimental physics. After acting as a substitute for his uncle **Daniel** at the univ. of Basel for some time, he became prof. of mathematics at St Petersburg in 1788, and was accidentally drowned the following year while bathing in the Neva.

Bernoullian Numbers, series of numbers used in the expansion of a large number of functions; named after **Jacques Bernoulli** (q.v.). They can be obtained by making use of the expansion of the function

$$\frac{x}{e^x - 1} = 1 - x/2 + B_1 x^2/2! - B_2 x^4/4! + B_3 x^6/6!$$

... in which $B_1 = 1/6$, $B_2 = 1/30$, $B_3 = 1/42$, $B_4 = 1/30$, $B_5 = 5/66$, $B_6 = 691/2730$, etc. As an example of their use, $\tan \frac{1}{2}x = B_1 x(2^2 - 1) + B_3 x^3(2^4 - 1)/3.4 + x \cot x = 1 - 2^2 B_1 x^2/2! - 2^4 B_3 x^4/4! - 2^6 B_5 x^6/6! - \dots$ The sum S_n of the same power r of the natural numbers from 1 to n can be expressed as follows: $S_n = n^{r+1}/(r+1) + n^{r-1}/2 + B_1 n^{r-1}/2! - B_r r(1) (r-2)n^{r-3}/4! + B_r r(1)(r-2)(r-3)(r-4)n^{r-5}/6! + \dots$

They appear in many other series.

Bernstein, **Eduard** (1850-1932), Ger. socialist and writer. *b. Berlin*, son of an engine-driver. He became a journalist, and on account of his political views was obliged to leave Germany in 1878; he then went to Switzerland, and with **Bebel** conducted the *Sozialdemokrat* at Zürich, 1881-90—moving to London in 1888, and living there until his return to Germany in 1901. He then became editor of the *Dokumente des Sozialismus* and *Welt am Montag*. He was a member of the Reichstag, 1902-6, 1912-18, and 1920-8. His works were critical of the doctrines of Marx, and he advocated socialist co-operation with other political parties.

Bernstein, **Henry** (1876-1953), Fr. dramatist, *b. Paris*, of Jewish extraction. Was educ. at Cambridge Univ. for 2 years, but took no degree. From the outset B. opposed Socialism; this and his bitter feeling towards the anti-Semites are apparent in his plays, mainly dependent on outer effects. The best of the earlier plays are *Le Délour*, 1902; *La Rafale*, 1906; *Israël*, on an anti-Semitic theme, 1906; *Le Voleur*, the theme being a husband's discovery of his wife's theft, 1907; and *Samson*, 1909. In 1911 B. fought a bloodless duel with **Francis Chevasson**, dramatic critic of the *Figaro*, and there was further trouble on the production of his *Après Moi* at the Comédie Française in the same year. One of his greatest triumphs was *Le Secret*, 1913, and *Judith*, 1922, on the theme of the biblical story. Other plays are *L'Assaut* (Eng. trans., 1912), *The Attack*, produced in 1924), *Félicie*, 1926, and *Melo*, 1929. See *L. le Sidaner*, **Henry Bernstein**, 1931.

Bernstein, **Herman** (1876-1935), Amer. writer and diplomat, *b. Russia*, of Jewish parentage. He came to the U.S.A. with his parents in 1893, and finished his education in New York City. He acted as correspondent for the *New York Herald* with the Amer. Expeditionary Force in Siberia. *The Willy-Nicky Correspondence*, pub. in 1918, was sensational

in revealing the secret telegrams exchanged between the ex-Kaiser Wilhelm II and Tsar Nicholas. In 1928 he pub. a biography of Herbert Hoover, who in the same year was elected President.

Bernstorff, Andreas Peter, Count von (1735-97). Dan. statesman, b. Hanover, the nephew of Johann B. As minister of foreign affairs in 1773, he brought about the 'armed neutrality' compact with Russia, and adopted an anti-Swedish policy. His understanding with Great Britain as to the term 'contraband of war' displeased Russia and he was obliged to resign office in 1781. However, he was returned to power in 1784, and during the Fr. wars maintained a neutral policy.

Bernstorff, Christian Günther, Count von (1769-1835). Dan. diplomat, the son of Andreas Peter B., b. Copenhagen, d. in Berlin. He became minister of foreign affairs, 1793-1810, and Dan. plenipotentiary at the Congress of Vienna, 1814. He entered the Prussian service in 1818, and was minister of foreign affairs from 1818 to 1831.

Bernstorff, Johann Hartwig Ernst, Count von (1712-72). Dan. statesman, of an ant. Ger. family, b. Hanover. He entered the Dan. service in 1732: was educ. by his grandfather, minister of George I. Having been for 6 years ambas. at Paris, for 21 years following he controlled the foreign policy of Denmark (1751-72), his adopted country. The settlement of the disputes between Russia and Denmark on the question of Holstein-Gottorp was not the least of his achievements. By the treaty of 1765, Catherine II renounced all pretensions to Holstein.

Bernstorff, Johann Heinrich Andreas Hermann Albrecht, Count von (1862-1939). Ger. diplomat, b. London, his father being the Prussian minister-afterwards Ger. ambas. He was educ. at Ratzeburg (Lauenburg). In 1889 he entered the diplomatic service, and was secretary to the embassy in London, 1902-6. Then he was consul-general in Egypt until, in 1908, he was sent as ambas. to Washington. He remained in America until the U.S.A. declared war in April 1917. For the next 3 years he was Ger. ambas. to Turkey. In 1921 he entered the Reichstag as a Liberal, and also became president of the League of Nations Union in Germany. In 1926 he headed the Ger. delegation to the League of Nations Preparatory Commission on Disarmament. When Hitler came to power in 1933, he went into self-imposed exile in Switzerland, and d. in Geneva. His book *Deutschland und Amerika: Erinnerungen aus dem fünfjährigen Kriege*—trans. as *My Three Years in America*—was pub. in 1920.

Beroe, marine organism belonging to the coelenterate order of Ctenophora. It differs from the other genera of Ctenophora in having no tentacles of any kind, and in having a capacious stomodaeum resembling the cavity of a thimble. It is conical or oval in shape, and there is a coelenteric network all over the body,

formed by anastomoses of the meridians and paragastric canals. It is transparent and gelatinous, and shines at night with phosphoric radiance, produced by the 8 bands of fused cilia, by means of which it moves.

Beroea: 1. Anct. name of Veria, or Kara-Feria, tn of Macedonia, Greece, 35 m. SW. of Salonika. It was besieged by the Athenians in 432 BC, occupied by the Romans in 168 BC, and captured by the Turks in AD 1375. St Paul preached there in AD 54.

2. Anct. name of Aleppo (q.v.), cap of a vilayet of the same name in N. Syria, on R. Kuweik, 70 m. E. of the Mediterranean. The name of B. was given it by Seleucus Nicator, and it is mentioned as Helbon (i.e. Aleppo) in Ezek. xxvii. 18.

Berossus, Babylonian priest, fl. c. 260 BC. Josephus has preserved some fragments of his Babylonian-Chaldaean hist., which he wrote in Greek. They are considered trustworthy because he had access to native documents stored in the temple of Bel at Babylon.

Berosus, genus of coleopterous insects of the family Hydrophilidae. The species inhabit ponds, in which they swim in an inverted position, and they probably feed on vegetable substance. They are nearly oval in shape, and of a dusky yellow hue.

Beroun (Ger. Beraun), Czechoslovak tn in the region of Prague (q.v.), on the Berounka. It has textile, asbestos, and cement manufs., and there are coal and iron mines near by. Pop. 12,400.

Berre, Etang de, salt-water lagoon in France, in the dept of Bouches-du-Rhône, W. of Marseille (q.v.). It is joined to the Mediterranean by the Martigues canal and the Rove tunnel, and has on its banks oil-refineries, oil-fisheries, and salt works. Area 60 sq. m.

Berri, or **Berry**, Charles Ferdinand, Duc de (1778-1820). b. Versailles, a younger son of the Comte d'Artois, afterwards Charles X. of France. At the revolution he escaped with his father to Italy, fought under Condé (1792-7), and came to England in 1801, where he married a Miss Anna Brown; this marriage was annulled for political reasons in 1814, and in 1816 he married Caroline Ferdinande Louise (1798-1870), daughter of Francis I. of Naples, by whom he had a daughter, later Duchess of Parma, b. in 1819, and a son, Henri, Duc de Bordenaux, better known as the Comte de Chambord (q.v.). b. posthumously, 1820, after his father had been assassinated at the Paris opera house, 13 Feb. of that year.

'Berrow's Worcester Journal', Britain's oldest surviving newspaper (if the specialised *London Gazette* (q.v.) is excepted), founded 1690, and undergoing various changes of title up to 1753 when it was estab. as *B. W. J.* In its early years it pub. only news of war and high politics, and it was a long time before any appreciable space was given to local affairs. H. Berrow acquired the paper in 1748, and his name was finally added to the title. Earlier files of the paper show that it sold not only news and

advertising space, but books and stationery, and even 'elixir for dropsy, powder for the gout, Hypo drops,' and other remedies which the printer kept in his cupboard. After the death in 1894 of Charles Henry Kirkbeck, one of its most noted proprietors, a number of local Conservatives formed a private company and purchased it. It is now independent and is owned by Berrow's Newspapers Ltd as one of a group of W. Midlands newspapers. Its chief competitor, the *Worcestershire Advertiser* (founded 1861) has been absorbed in it.

Berruguete, Alonzo (1480-1561), Sp. painter, sculptor, and architect, son of a painter, Pedro B. (q.v.), studied under Michelangelo. Charles V appointed him court painter and sculptor. B. completed the royal palace at Granada, and designed the town hall at Seville and the palace of the Archbishop of Toledo at Alcalá. His finest piece of sculpture is 'The Transfiguration' in the Toledo Cathedral.

Berruguete, Pedro (d. 1503), Sp. painter who lived towards the end of the 15th cent. Most of his paintings were hung in the museum at Madrid. The frescoes in the cathedral at Toledo are thought to be the joint work of B. and another artist. Other works attributed to him are the 'Miracles of the Life of St Peter,' 'St Thomas Aquinas,' and 'Christ in the Garden' (at Avila), and 'Christ in the Garden' and 'The Resurrection' (at Madrid).

Berry, Sir Edward (1768-1831), Eng. naval officer. In 1796 he first came under the notice of Capt. Nelson, and for his services at the siege of Porto Ferrajo B. received promotion to the rank of commander. He distinguished himself for his daring at the battle of Cape St Vincent. B. was captain of Nelson's flagship at the battle of the Nile, of which he later wrote a narrative. B. carried Nelson's dispatches home on the *Leander*, when he was taken prisoner by the French. He also took part in the battle of Trafalgar, 1805. He was knighted 1798; K.C.B., 1815; rear-admiral, 1821.

Berry, James (d. 1655), soldier and parliamentarian, b. Salop. He enlisted under Cromwell, and fought at the battle of Gainsborough, 1643. In 1647, B. was elected president of the council of adjutors in the disputes between Parliament and the Army. In 1655 he was made major-general of Hereford, Salop, and Wales. He sat in Parliament as member for Worcs in 1657, and was made a member of the council of state in 1659. On the Restoration, he was imprisoned in Scarborough Castle.

Berry, Sir John (1635-90), admiral, b. Devonshire. He first went to sea in the merchant service, his first naval appointment being in 1663, when he served as boatswain of the *Swallow* in the W. Indies. In 1667 he commanded a squadron against the combined forces of French and Dutch near St Nevis and St Kitts. In 1672 he distinguished himself at the battle of Sole Bay, and was knighted for his services. His death, at Portsmouth, has been attributed to poisoning.

Consult J. Campbell, *Lives of the British Admirals and Eminent Seamen*, 1779.

Berry, John Bennington (1851-1928), Amer. railway engineer, b. Paterson, New Jersey; educ. at the Polytechnic Institute at Brooklyn. He entered the railway service in 1874, and served successively, as assistant or chief engineer, the Chicago and NW., the Union Pacific, and the Chicago, Rock Island, and Pacific railways. Set up as railway consultant in Chicago in 1914 and wrote authoritatively on railway gradients.

Berry, Mary (1763-1852), authoress, b. Kirkbridge, Yorks. In 1788 she and her younger sister Anne made the acquaintance of Horace Walpole, who held them in great affection, and left them in his will £4000 each and some property at Little Strawberry Hill. Mary B. collected and ed. the *Works of Horace Walpole*, 1798, and also pub. *England and France: a Comparative View of the Social Condition of both Countries*, 1844. See her *Journals and Correspondence* (2nd ed.), 1866, and *The Berry Papers*, ed. L. Melville, 1914.

Berry, William Ewart, see CAMROSE.

Berry, anct prov. of central France, now the depts of Indre and Cher, and parts of Crouse, Nièvre, and Allier. It came to the crown in 1100, and became a duchy in 1360. Its cap. was Bourges (q.v.).

Berry, name of a baccate or fleshy fruit, which differs from the drupe (e.g. cherry) in having no hard part but the seeds; while the drupe has a strong endocarp. All these fruits are soft and succulent, and have their seeds embedded in the pulp. Many so-called berries have no right to the name, e.g. the holly-berry, which is a drupe; the strawberry, a pseudocarp formed from an etaeo of achenes on a fleshy thalamus; while raspberries and blackberries are etaeos of drupes. True berries are the gooseberry, tomato, currant, bilberry, and grape, while the orange, melon, and cucumber come under this head, and the banana, in which over-cultivation has destroyed the seeds.

Berryer, Antoine Pierre (1790-1868), Fr. barrister and politician, b. Paris. After the Restoration he defended Ney before the chamber of peers, and successfully defended a number of other Napoleonic generals. Other political trials in which he appeared for the defence were those of Lamennais, 1826, Chateaubriand, 1833, and Montalembert, 1858. Elected to Parliament before the revolution in 1830, he remained the only legitimist deputy till 1851; though a Liberal, he never ceased to advocate the restoration of the Bourbons. He was elected to the Academy in 1854.

Bersaglieri, i.e. sharpshooters, a corps d'élite of infantry (riflemen) in the It. army. They were raised in 1836 for the Sardinian-Piedmontese army under King Charles Albert on the suggestion of Capt. Alessandro La Marmora of the Granatieri-Guardia (Grenadier Guards), who was the original commander. They were trained in scouting, rapid marching, and shooting ('bersaglio' = target). Originally consisting

of two companies, the B. before 1914 comprised 12 regiments, and, during the First World War, were expanded to 21 regiments. Their uniform is a dark blue with a red stripe and facings, but their chief distinguishing mark is the wide black slouch hat with heavy drooping plumes of cocks' feathers. They have a distinguished record and are regarded with pride in Italy. They have participated in all It. campaigns. During the Crimean war 5 battalions served with the Allies, but their creator and leading spirit, La Marmora (then a general), *d.* of cholera. During the First World War their 3rd Regiment was awarded the Gold Medal for Valour, the highest It. distinction, for service on the Piave. In 1895 a cyclist company was added to the B. as an experiment, the success of which led to a general creation of cyclist companies in the army. In 1940 the It. army was reorganised, and provision made to include 12 regiments of B. in the Infantry.

Berseem, or **Bersim** (*Trifolium alexandrinum*), Egyptian name of a species of white clover which thrives well on salt land newly reclaimed from the sea. In the Nile Delta it is grown as fodder for animals, and its cultivation prepares the land for subsequent crops.

Berserker (from the 'sark,' or shirt, of the bear, or the skins of other animals), name given to the 12 sons of the Norse hero, Berserk, by the daughter of King Swafurlam, whom he had killed in battle. Berserk was the grandson of fair Alfhilde and the eight-handed Starkadder. His sons inherited his martial fury, the berserker rage, as well as his courage. They terrified their enemies and were thought to be possessed of an evil spirit. One legend says that they perished all in one combat.

Bersim, see **BERSEEM**.

Berstadt, (Ger. tn in Hessen (q.v.). 37 m. N.E. of Wiesbaden (q.v.). Pop. 5000.

Bert, Paul (1833-86), Fr. physiologist and politician, *b.* Auxerre; first studied engineering, but then under the influence of L. P. Gratiolet became a pupil of the great physiologist Claude Bernard. He was prof. of physiology at Bordeaux and the Sorbonne, Paris. His prin. scientific researches and experiments were on the effects of air-pressure (*La Pression barométrique*, 1878, Eng. trans., 1943), of value in the study of caisson disease; on anaesthetics and respiration, and on the effect of light on plant growth. In 1876 he became a deputy, entering politics as a violent anti-clerical; he was minister of education, 1882, in Gambetta's ministry; in 1886 he was appointed resident to Indo-China, and *d.* there at the end of the same year. Life by H. Depasse, 1883.

Bertani, Agostino (1812-86), It. revolutionary, *b.* Milan. He practised medicine in Lombardy till the outbreak of the revolution of 1848, in which he was implicated. He organised the ambulance service during the Rom. rep., 1849, and, with Sir James Hudson, worked in Naples for the liberation of political prisoners. Later, he joined Garibaldi's force as a surgeon, and organised 4 Sicilian volunteer

expeditions. When Garibaldi went to Naples B. became his secretary-general. He later had a distinguished parl. career, being a fervent advocate of social reform.

Bertha, name of sev. reigning princesses of the early Middle Ages: 1. Daughter of the Frankish Christian King, Haribert or Charibert, married Ethelbert (560-616), King of Kent. She brought to England her confessor, and was allowed by the king to practise her religion at her oratory, St Martin's, Canterbury, and thus paved the way for the success of Augustine's mission.

2. Mother of Charlemagne, called Bertrada or Bertha Greatfoot. She was the daughter of Charibert, Count of Laon, and married Pepin before 742. Round her have grown many legends set forth in Adenès's 13th-cent. romance *Berte aus grans piés*. Charlemagne married Bertha (or Desiderata), daughter of the Lombard King Desiderius.

3. Daughter of Burkhardt of Thurgau, and wife of Rudolf II, King of Burgundy (912-37). Her deeds of charity and piety gained her the name of the Good.

Bertha, Big, nickname given to the specially prepared long-range Ger. naval gun (or guns) which fired on Paris from the neighbourhood of Coucy, a distance of 75 m., during the First World War. The name was in allusion to the fact that Frau Bertha von Böhlen was one of the proprietors of Krupp's (q.v.), which firm made the gun. Twenty-one shells, of over 200 lb. each, were fired on 23 Mar. 1918, the first day on which the gun was used against Paris, and thereafter there was intermittent fire for sev. months. Fatal casualties caused are variously given at between 100 and 200 for the whole period of firing.

Berthelot, Marcellin Pierre Eugène (1827-1907), Fr. chemist and politician, *b.* Paris in Oct.; the son of a doctor. He was appointed a member of the staff of the Collège de France in 1851, at which time his long intimacy with Renan began. His paper *Sur les combinaisons de la glycérine avec les acides* made him famous in 1854, and in 1865 he accepted a chair of organic chem. in the Collège de France, an appointment which had been specially created for him. He succeeded Pasteur as permanent secretary to the Academy of Sciences in 1889. In 1895 he was minister of public instruction during the Goblet ministry. His works include many papers and books, among them, *Chimie organique fondée sur la synthèse*, 1860, *Les Carbures d'hydrogène*, 1901, *Science et philosophie*, 1886, and *Science et morale*, 1897.

Berthelot, Philippe Joseph Louis (1866-1934), Fr. diplomat, *b.* Sèvres; educ. at Lycées Saint Louis and Henri IV. He entered the diplomatic service in 1889, and in 1920 was appointed secretary-general to the Ministry of Foreign Affairs, with rank of ambas. In 1922, as a result of inquiry into the affairs of the Industrial Bank of China, B. was suspended for 10 years. Under the premiership of Herriot in 1925 he was 'amnestied' and re-appointed secretary-general, and he was

instrumental in the creation of the Little Entente.

Berthier, Pierre Alexandre (1753-1815), Fr. general; proclaimed the rep. in Rome in 1798. As chief of the staff he accompanied Napoleon to Egypt, and also in the campaigns of 1812-14. On Louis XVIII's accession he surrendered Neuchâtel, of which he had been created prince in 1806, and submitted to the king. When Napoleon returned from Elba he committed suicide.

Berthierite, dark steel-grey mineral, composed of sulphides of iron and antimony. It occurs in elongated prisms, has a hardness of 2 to 3 and a sp. gr. of 4 to 4.3. B. is found in Auvergne and the Vosges, in Saxony, in Cornwall, and in Lower California. It receives its name from the Fr. chemist, Pierre Berthier (1782-1861).

Berthold von Regensburg (1220-72), Ger. Franciscan preacher, b. Regensburg; educ. in the Franciscan monastery there under David of Augsburg. His teaching was mainly directed against luxury, the abuses of so-called chivalry, and the vices of the clergy. His *Sermons* have been ed. by Pfeiffer and Strebl (2 vols.), 1862-80, and by Göbel (trans. into modern German, 1873). See his life by J. Paul, 1896, and Unkel, 1882.

Berthollet, Claude Louis (1748-1822), Fr. chemist, b. Talloire, in Savoy. He graduated in medicine at Turin, settled in Paris in 1772, and was elected a member of the Academy of Sciences in 1780. Five years later he declared himself a convert to the new theories of combustion propounded by Lavoisier, although previously he had pub. papers in support of the old. He helped Lavoisier to reform chemical nomenclature, and was the first to advocate the use of chlorine as a bleaching agent. As he regarded chlorine as oxygenated muriatic acid, he could not appreciate the nature of the chlorates which he discovered. He also devoted serious attention to the process of smelting and converting iron into steel. Napoleon was his generous patron.

Bertholletia, genus of Locythidaceae growing in tropical S. America, and having only 2 species of tall trees; *B. excelsa*, yielding the Brazil nuts of commerce; and *B. nobilis*, the source of Para nuts.

Berthon, Edward Lyon (1813-99), inventor, b. London. He studied surgery at Liverpool and Dublin, and lived for some years (1834-40) abroad, where he experimented on screws for propelling ships. His model of a screw propeller was, however, rejected by the Admiralty, though afterwards adopted. In 1841 he went to Cambridge, and took holy orders in 1845. His other mechanical inventions were 'Berthon's log' for measuring the speed of ships, an instrument for discovering the trim of a boat, and collapsible boats, which were first ordered by the Admiralty in 1873. He wrote his reminiscences under the title *Retrospect of Eight Decades*, 1899.

Bertie, Peregrine, Lord Willoughby de Eresby (1555-1601), Eng. soldier, son of Richard and Catherine B., Baroness Willoughby de Eresby. He was b. at

Lower Wesel, Cleves, at the time of the Marian persecution in England. His family returned to England in 1559, when a patent of naturalisation was obtained for him. He married a daughter of John de Vere, Earl of Oxford, and in 1580 succeeded to his mother's title. In 1586 he was made governor of Bergen-op-Zoom, in succession to Sir Philip Sidney. Later, he succeeded the Earl of Leicester as commander of the Eng. forces in the Low Countries. Subsequently he was placed at the head of an army which went to the help of Henry of Navarre at Dieppe, 1589, and was present at the capture of Vendôme, Mons, Alençon, and Falaise.

Bertie, Robert, 1st Earl of Lindsay (1582-1642), admiral, eldest son of Peregrine B. (q.v.), and godson of Queen Elizabeth I. He joined the Sp. expedition of the Earls of Essex and Nottingham, and was knighted in the marketplace of Cadiz, on its capture, 1597. In 1628, after the assassination of Buckingham, he was appointed admiral of the fleet, and headed an expedition (which failed) for the relief of La Rochelle. He became Lord High Admiral in 1636. He supported Charles I during the Civil war, and d. from wounds received at Edgehill. He drained and reclaimed parts of the Lincs. fens.

Bertie, Willoughby, 4th Earl of Abingdon (1740-99), statesman, educ. at Westminster School and at Magdalen College, Oxford. He was a supporter of Wilkes. B. succeeded to the earldom in 1760, and frequently spoke in the House of Lords. He pub. numerous pamphlets, which include *A Letter to Lady Loughborough*, 1798, which is a eulogy of the Fr. Revolution.

Bertillon System. Name given to a system of anthropometry invented by Alphonse Bertillon (1853-1914). It consists of measurement of certain parts of the human body, which he found by research to be practically unchanging after full growth. By these it is claimed that it is possible so to classify any individual as to be able to identify him without fail for the rest of his life. For police purposes this was invaluable, and Bertillon's system was adopted in many countries. The essential measurements included (1) length of head, (2) breadth of ditto, (3) length of middle finger, (4) of left foot, (5) of forearm from elbow to tip of middle finger. Each of these measurements was classified as small, medium, or large, and height, length of little finger, and colour of eyes were also observed. The measurements, however, had to be so extremely accurate, and required such carefully trained observers, that the process of 'Bertillonising' was slow and expensive. As the slightest mistake in one respect might vitiate a whole record, it was necessary to take the mean of at least three measurements. The development of identification by fingerprints (q.v.) led to the latter's replacing the B. S. as the main accepted system of identifying criminals.

Bertin, Louis François (1766-1841), the

'father of Fr. journalism,' b. Paris. He wrote for the *Journal Français* during the Fr. Revolution. He founded the *Journal des Débats* after the 18th Brumaire. In 1801 he was banished for suspected royalist tendencies. Three years later he returned, taking up the management of the paper. Meanwhile Napoleon had altered the title to *Journal de l'Empire*. Gov. censorship and control followed. B. regained possession in 1814, still supporting the royalist cause till his death in 1841.

Bertinoro, It. tn. in Emilia-Romagna (q.v.), 8 m. SE. of Forlì (q.v.). It is a spa, and has a trade in oil and wine. Pop. 9100.

Bertran de Born, Viscount of Hautefort (c. 1170-1200), Provençal troubadour, b. of noble family, near Limoges. He became a vassal of England by the marriage of Eleanor to Henry II of England, and was patronised by Henry Curtmantle, son of Henry II. Dante has placed him (*Inferno*, canto xxviii) among the sowers of discord in hell, where he appears carrying his severed head before him; this referring to the way in which he fostered and took advantage of the ill-feeling existing between the 3 sons of the king. During 1182-3 he joined with the barons of Limoges, Poitou, and Périgord in their revolt against Richard I of England. About 1196 he entered a Cistercian monastery at Dalon, where he d. His poems, of which 45 are still extant, deal with 'arms and men,' and are either in praise of his patrons or depreciation of his enemies. The style is vigorous and bitter, but his love-poems and two *planhs* on the death of Prince Henry, are tender and sincere. They have been ed. by Stimming (1879), Thomas (1888), and C. Appel (1932). See C. Appel, *Bertran von Born*, 1931.

Bertrand, Henri Gratien, Count (1773-1844), Fr. general. He entered the army at the outbreak of the Fr. Revolution. He was made a colonel by Napoleon during the Egyptian expedition, and was afterwards his aide-de-camp at Austerlitz. Napoleon appointed him grand marshal of the court in 1813. In 1814 he accompanied Napoleon to Elba, and returned after Waterloo to St Helena with him. After Napoleon's death he was elected deputy in 1830 in the reign of Louis XVIII, and later brought the remains of Napoleon to France. Hed. at Châteauroux.

Bertrand, Jacques Louis Napoleon (1807-41), Fr. poet, also known as Aloysius, b. Ceva, Piedmont. He spent most of his life in Dijon. His style, both in prose and verse, is marked by purity and rhythm; indeed, the love of language was almost an article of faith with him. His poetry was little in output but excellent in quality. When the Revolution of July broke out, he served it with enthusiasm, contributing to the Dijon pub., *Le Patriote de la Côte d'Or*. He created the form of the prose poem. His most notable work, *Gaspard de la nuit*, was pub. at Angers, posthumously, by his friends, the title being theirs. The best in the collection are *La Barbe pointue* and

Madame de Montbazou. See C. Spritsma, *Aloysius Bertrand*, 1926.

Bertrand, Joseph Louis François (1822-1900), mathematician, b. Paris; educ. at the Polytechnic School. In 1856 he became a member of the Academy of Sciences, in 1874 perpetual secretary of that body, and in 1884 a member of the Fr. Academy. He pub. works on arithmetic, algebra, calculus, thermodynamics, probabilities, and theoretical dynamics.

Bertrand, Louis Marie Emile (1866-1940), Fr. author, b. Spincourt (Meuse). From 1897 until 1900 he was prof. of classics at Aix, Bourg, and Algiers. His first novel, *Le Sang des races*, 1899, was a tale of the Fr. pioneers in Algeria. Other novels which all reveal a great gift of expression, include *Le Rival de don Juan*, 1903, *Mademoiselle de Jessincourt*, 1911, and *L'Infante*, 1920. He has also written: *La Grèce du soleil et des paysages*, 1908; *Le Livre de la Méditerranée*, 1911; *Les Villes d'or*, 1921. In biography: *Saint Augustin*, 1913; *Louis XIV*, 1923; *Sainte Thérèse*, 1927. Later works include: *Carthage*, 1930; *Le Roman de la conquête*, 1931; *Histoire d'Espagne*, 1932.

Beruni, or Al-Beruni (973-1048), Arabian scholar, astronomer, mathematician, and historian. Beside works on mathematics he wrote the *Chronology of Ancient Nations* and, after a visit to India, *India*, the first book by a Muslim which shows an interest in the religion, philosophy, and customs of a non-Muslim people. On his return from India he lived at Ghazni, the cap. of Sultan Mahmud.

Bervie, Charles Clément (1756-1822), Fr. engraver, b. Paris. His full-length engraving of Louis XVI from the portrait by Callet ranks among the finest works of its kind extant.

Bervie, see INVERBERVIE.

Berwick, James Fitz-James, Duke of (1670-1734), soldier, illegitimate son of the Duke of York, afterwards James II, by Arabella Churchill, the sister of the famous general, Marlborough. Educ. in France, on his father's accession he entered the imperial army, serving his apprenticeship as a soldier in Hungary under the Duke of Lorraine. Later he accompanied his father into exile, took part in the battle of the Boyne, and in 1690 was made generalissimo of the Irish forces on the side of James. Later he transferred his services to France. In 1693 he was taken prisoner at the battle of Lindenberg, but was exchanged for the Duke of Ormonde. His attempt in 1696 to stir up an insurrection against William III was a failure. After suppressing the religious revolts in the S. of France, he distinguished himself, during the war of Sp. Succession, by defeating the allied forces under Gen. Stanhope in the battle of Almanza. See lives by Lt.-Col. C. I. Wilson, 1883, and Sir C. Petrie, 1953.

Berwick-upon-Tweed, seaport, municipal bor., and administrative co. of Northumberland, England, situated at the mouth of the R. Tweed on the N. bank. The tn is connected to the S. bank by 2 bridges. It was one of the first 4 royal bors. of Scotland, and between

1174 and 1406 changed hands between Scots and English 8 times. In 1551 B. was declared a neutral ter. There are ruins of a bell tower which was used to alarm the neighbourhood during border raids. The chief public building is the tn hall (1760). The prin. exports are grain, coal, and fish; among B.'s sea fisheries are those for salmon. The tn has iron works and shipbuilding yards, and small tweed and hosiery mills. A trading estate is being developed by the Corporation. Pop. 12,550.

the Leader, Eden, Leet, and Whiteadder, tribs. of the Tweed. Agriculture is important, and the prin. grain crops are oats and barley, though wheat is also raised. Sheep and cattle are pastured in large numbers. Fishing is the secondary occupation; the chief tns engaged in the fishing industry are Eyemouth, Burnmouth, Coldingham, and Cove. Small quantities of coal, copper-ore, and ironstone are found, and there are large deposits of limestone. Gingham and woollen cloth stuffs are manuf. at



'Scoleman'

FISHERMEN'S COTTAGES AND BOATS AT COVE HARBOUR, BERWICKSHIRE

Berwickshire, co. of Scotland, bounded on the NW. by E. Lothian, on the NE. by the N. Sea, on the SE. by Northumberland, on the S. by Roxburgh, and on the SW. by Midlothian. There are traces of anct Brit. and Rom. settlements in B.; after the Rom. occupation the co. was included in the kingdom of Northumbria, and in 1018 it was finally annexed to Scotland. Fast Castle on the coast N. of St Abbs Head, and Dryburgh Abbey (q.v.) are 2 of the picturesque ruins to be seen in the co. There are 3 natural divs. of B., Lauderdale, the valley of the Leader; Lammermuir, an upland dist. formed by the Lammermuir Hills; and the Merse. The average height of the Lammermuirs is 1000 ft, and Meikle Says Law (1749 ft) is the highest point. The coast of B. is precipitous. St Abbs Head rises to 310 ft and possesses a lighthouse. The riva. of the co. are the Ewe, and also

Earlston, while blankets and plaids are produced at Cumledge. Distilling and brewing are other industries. Duns is the co. tn. With E. Lothian, B. returns one member to Parliament. Area 457 sq. m.; pop. 27,000.

Berwyn, city in Illinois, U.S.A., a residential suburb of Chicago with some manufs. Pop. 51,300.

Beryl, mineral consisting of silicates of beryllium and aluminium, represented by the formula $\text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18}$. It crystallises in hexagonal prisms, usually of a greenish colour. The transparent green varieties are known as emerald (q.v.), and those of a bluish-green colour are termed aquamarine (q.v.). Transparent B. is known as precious B., and the opaque varieties are known as common B. B. is widely distributed, being found in Aberdeenshire, the Mourne Mts in Ireland, Siberia, Brazil, Ceylon, and many localities in the U.S.A.

Beryllium, or **Glucinum**, metal of the magnesium group, discovered in the form of oxide in the mineral beryl in 1798. The oxide was first called glucina from the sweet taste of its salts, but was afterwards called beryllia by the Ger. chemists. The metal was first obtained by Wöhler in 1828 by reducing the chloride with potassium, when the metal appears as a dark grey powder. In 1855 Debray prepared it in a compact state by heating B. chloride and metallic sodium in separate receptacles in an atmosphere of hydrogen. The metal thus produced has a sp. gr. of 1.64, is silver-white in colour, melts at a lower temp. than silver, and in the powdered state takes fire when heated in air. B. oxide, or beryllia, is obtained by fusing beryl with twice its weight of potassium carbonate. The molten mass is allowed to cool, and is then treated with sulphuric acid, the excess of acid evaporated off, water added, and the silica filtered out. On cooling, the liquor contains mainly the sulphates of B. and iron. It is poured into a hot and strong solution of ammonium carbonate, allowed to stand for some days, and then filtered. The filtrate contains the B., and on boiling basic B. carbonate is precipitated. The precipitate is redissolved in ammonium carbonate solution and steam blown through the liquid, when the beryllia is precipitated.

Beryllonite, mineral consisting of beryllium sodium phosphate, formula BeNaPO_4 ; discovered in Maine, U.S.A., in the form of ortho-rhombic crystals. It has been used as a gem. It varies from colourless to pale yellow, is vitreous, and transparent.

Berzelite, or **Berzelianite**, silver-white mineral composed of copper selenide (Cu_2Se), occurring at Skrikerum in Sweden and also in the Harz Mts. B., as named by L. A. Necker, is a white translucent mineral found near Albano, and composed of silicates of aluminium, sodium, and calcium.

Berzelite, or **Berzellite**, yellow or yellowish-red mineral occurring as isometric crystals and consisting of orthoarsenate of calcium, magnesium, or manganese. It is found at Långban in Sweden. Pyrrharsenite, in which antimony takes the place of part of the arsenic, is lighter in colour and occurs at Örebro in Sweden.

Berzelius, Jöns Jakob (1779-1848), Swedish chemist, b. Vårversunda Sörårgård, Sweden. In 1818 he became perpetual secretary to the Stockholm Academy of Science. His special study was devoted to the significance of atomic and molecular weight, and he pub. a table of results remarkable for their accuracy. He held that the essence of chem. was based upon oxygen. Later he developed an acute interest in electrochemistry. He was the first to adopt the symbol system of alluding to chemical substances. His works include *Lehrbuch der Chemie* and *Jahresbericht*, both works notable for their literary quality besides their scholarship. Of the latter work, which was a yearly record of Stockholm Academy science progress, he issued 27 vols. He

invented many improvements of the blow-pipe and threw much light upon the substances tellurium, selenium, silicon, thorium, titanium.

Berzin, Jan (1881-1938), Latvian Communist. Before 1917 he spent many years in W. Europe and the U.S.A. After 1918 he was chiefly active as a Soviet diplomat (was Minister to Switzerland, Finland, and Austria, worked in the Soviet Embassy in Britain 1921-5). Later he became one of the main organizers of the forced labour camp system in the U.S.S.R., and from 1932 was the head of the Dal'stroy (q.v.) industrial combine and labour camps. B. was shot in the course of the Great Purge. See V. Petrov, *It Happens in Russia*, 1951.

Bēa, popular Egyptian domestic deity, first appearing in the Middle Kingdom in a form suggesting he was originally a cat, destroyer of harmful snakes—the name is connected with African words for 'cat.' He soon became a dwarf dressed in a cat-skin, often with a feather head-dress. Patron of mirth and birth.

Besançon, Fr. city, cap. of the dept of Doubs, on the Doubs. Known to the Romans, as Vesontio, it was made a colony by Marcus Aurelius. It has been an archbishopric since the 4th cent. In the Middle Ages it was a free imperial city. It displaced Dôle as cap. of Franche-Comté (q.v.) when that prov. passed to France in 1678. The tn, surrounded by ramparts built by Vauban (q.v.), is in a loop of the riv.; on the open side is a citadel commanding the gap between the Vosges and Jura Mts. It has many splendid old buildings, including a cathedral partly 12th cent. It has a univ. Granvelle, Fourier, Proudhon, Nodier, and Victor Hugo (qq.v.) were b. here. It had a school of watchmaking, and is the prin. Fr. centre of watch manu. Automobiles, paper, artificial silk, and rayon are manu., and there is brewing. Pop. 73,500.

Besant, Annie, Mrs (née Wood) (1847-1933), socialist and theosophist, b. London. In 1867 she married the Rev. Frank B., vicar of Sibsey, Lincs, but became a free-thinker, and was legally separated from her husband in 1873. In the following year she joined the National Secular Society; she co-ed. with Charles Bradlaugh (q.v.) the *National Reformer*, and took a prominent part in his free thought and radical movement. She joined in various labour movements, became a member of the Fabian Society, and of the London School Board, 1887-90. In 1889 she became a pupil of Mme Blavatsky, and joined the Theosophical Society, of which she was president from 1907. She lectured on theosophy in all parts of the world, and founded at Benares the Central Hindu College, 1898, and the Central Hindu Girls' School, 1904. Later she was associated chiefly with the advocacy of the cause of Indian Nationalism. She pub. her life, under the title *Through Storm to Peace*, 1893. See life by G. M. Williams, 1932.

Besant, Sir Walter (1836-1901), author, b. Portsmouth. He was educ. at King's

College, London, and Christ's College, Cambridge, where he graduated as 18th wrangler. An interest in young and inexperienced authors caused him to found a Society of Authors with the object of protecting the rights of new writers. This was founded in 1884, and Sir Walter filled its chair till 1892. He married in 1895 Mary Foster-Barham, of Bridgewater, and shortly afterwards was knighted. Though Sir Walter plunged into many fields of literary art, his greatest success was in writing novels. He collaborated with James Rice (1844-1882) in the production of the first of these works of fiction: *Ready-Money Mortiboy*, 1872, and *The Golden Butterfly*, 1876, are two of the best. The influence of Dickens is apparent, not least in the vigour with which he portrayed social evils. The estab. of the E. End Institute, known as the People's Palace, in the Mile End Road, was one of the direct results of his powerful *All Sorts and Conditions of Men*, 1882, which he wrote alone, James Rice having d. The sweating evil next received his attention, and expression of his indignation was found in *Children of Gibeon*, 1886. Among other novels are *Dorothy Forster*, 1884, *Armored of Lyonesse*, 1890, and *Beyond the Dreams of Avarice*, 1895. Besides fiction, he wrote *The French Humorists*, 1873, *Rabelais*, 1879, and biographies of Whittington, Captain Cook, and Richard Jefferies. His monumental work, *A Survey of London*, on the hist. and archaeology of London, was never completed. See his autobiography, 1902.

Bessant, see ROUNDELS.

Bessler, Hans von, Prussian general (1850-1921). He captured Antwerp in Oct. 1914. In Aug. 1915 he took a distinguished part in the siege of Novogeorgievsk on the E. front, and became Governor-General of Poland until the armistice.

Bessler, Rudolf (1878-1942), Brit. playwright, b. Java, of Dutch parentage. Educ. at Elizabeth College, Guernsey, and Heidelberg, he was for sev. years a journalist. His plays include *The Virgin Goddess*, 1906, *Olive Latimer's Husband*, 1909, *Don*, 1909, *Lady Patricia*, 1911, *Kings and Queens*, 1915, *Buzell*, 1916, *Robin's Father* (with Hugh Walpole), 1918, *The Prude's Fall* (with May Edington), 1920, and *The Barretts of Wimpole Street*, 1930. The play last named is about the family of Elizabeth Barrett Browning.

Beskow, Bernhard von, Baron (1796-1868), Swedish poet and dramatist, b. Stockholm. In 1825 he became private secretary to the Crown Prince Oscar. He was director of the Royal Theatre in 1831-2, and in 1834 was elected permanent secretary of the Swedish Academy. His chief works are the poems *Karl XII*, 1819, and *Sveriges Anor*, 1824, and the dramas *Erik XIV*, 1827-8, and *Torkel Knutsson*, 1830. See J. E. Rydqvist, *Bernhard von Beskow*, 1947.

Besnard, Paul Albert (1894-1934), Fr. painter, b. Paris; he entered the studio of Cabanel in 1866, and won the Prix de

Rome in 1874. The impressionist study of light had some effect on his easel pictures but he is mainly known for large-scale mural decorations (École de Pharmacie, Sorbonne, Petit Palais).

Bessarabia, area in SE. Europe, between the R. Dniester and Prut, the Danube delta, and the Black Sea. In antiquity and the Middle Ages it shared the fate of other ters. N. of the Black Sea—recurrent nomadic invasions on one hand, Gk colonies, Rom. rule, Genoese colonies on the other. In 1367 B. was annexed by the newly formed principality of Moldavia which in 1513 was subjugated by Turkey. In 1812 B. was ceded to Russia and became a prov. of Nov Russia (q.v.). By the Paris Treaty of 1856, Russia abandoned S. B. (which was included in Rumania when it was formed in 1859), but regained it by the Berlin Treaty of 1878. After the Bolshevik seizure of power the anti-Bolshevik Land Council of B. declared in 1917-18 first the estab. of the Moldavian People's Rep. as a part of the Russian Federation, then its independence from Russia, and finally its incorporation into Rumania. This was recognised in 1920 by Britain, France, Italy, and Japan, but not by the Soviet Gov., which in 1940, by an ultimatum, forced Rumania to cede B. and N. Bukovina (see BUKOVINA). In 1941-1944 B. again belonged to Rumania, but was finally ceded to the U.S.S.R. by the peace treaty of 1947. The major part of B. forms the Moldavian Rep. (q.v.), while the N. and S., with a predominantly non-Rumanian pop., are included in the Ukraine (see CHERNOVITSY and ODESSA).

Bessarion, John (1395-1472), medieval scholar and ecclesiastic, b. Trebizond. He was appointed Archbishop of Nices in 1437, and in the following year attended the Council of Florence when he supported the union of the Gk and Lat. churches. Having joined the Lat. rite, he was made cardinal by Eugenius IV, served as papal legate at Bologna (1450-1455), and was appointed Lat. patriarch of Constantinople in 1463. B. d. at Ravenna, bequeathing his valuable collection of Gk MSS. to the Venetian Senate. He was one of the most learned scholars of that period; his prin. work is a Lat. trans. of Aristotle's *Metaphysics*, Paris, 1515. See L. Mohler, *Kardinal Bessarion als Theologe, Humanist und Staatsmann* (2 vols.), 1923-7.

Bessborough, Vere Brabazon Ponsonby, 9th Earl of (1880-), administrator, educ. at Harrow and Cambridge Univ. He was called to the Bar in 1903; Unionist M.P. for Cheltenham, 1910-13, and for Dover, 1913-20. In 1915 he served in Gallipoli with the Imperial Yeomanry, and, later, on the staff in France. He succeeded to the title in 1920, and from 1931 to 1935 was Governor-General of Canada. The earldom of B. in the Irish peerage dates from 1739; included in the peerage of the U.K. in 1937.

Bessbrook, vil. in co. Armagh, N. Ireland, 3 m. NW. of Newry, an early experiment in tn planning (1846),

founded for spinning, weaving, and bleaching linen. Pop. 2888.

Bessèges, Fr. tn in the dept of Gard, on the Cèze. It has coal-mines and iron-works. Pop. 5500.

Bessel, Friedrich Wilhelm (1784-1846), Ger. astronomer, b. Minden on 22 July. His investigations on Halley's comet, from some old observations going back to 1607, led to recognition by H. W. M. Olbers (q.v.), who pub. his results. Following this, he was installed by the King of Prussia as director of a new observatory at Königsberg. Here he stayed from 1813 till his death. He tabulated a catalogue of 3222 stars, and pub. it under the title *Fundamenta Astronomiæ*, 1818. B. is chiefly remembered for his success in determining the parallax of 61 Cygni. See BESSEL'S FUNCTIONS.

Bessels, Emil (1847-88), Ger. scientist and Arctic explorer, b. Heidelberg, and studied natural science and medicine there and at Jena. His first polar journey was made in 1869, and enabled him to demonstrate the presence of the Gulf Stream E. of Spitzbergen. In 1871 the U.S. Gov. appointed him chief of the scientific dept to the expedition under C. F. Hall in the *Polaris*. The vessel was wrecked and all B.'s collections lost in 1873. He pub. an account of the expedition in 1876, and also *Die Amerikanische Nordpolexpedition*, 1878.

Bessel's Functions, in mathematics, indicate certain relationships between two variables. F. W. Bessel (q.v.) introduced them in 1817 in investigating mathematical relationships in connection with planetary orbits. Later they have been employed in calculations concerned with the vibrations of a stretched membrane, thus contributing to the theory of sound; and in calculations connected with almost every branch of mathematical physics. Bessel's function of order m is indicated by the symbol $J_m(\rho)$, and satisfies the differential equation:

$$\frac{d^2\mu}{d\rho^2} + \frac{1}{\rho} \frac{d\mu}{d\rho} + \left(1 - \frac{m^2}{\rho^2}\right)\mu = 0.$$

See A. Gray and G. B. Matthews, *Treatise on Bessel's Functions and Applied Physics* (2nd ed.), 1922.

Bessemer, Sir Henry (1813-98), engineer, b. Charlton, Herts. He was the author of many inventions, particularly the special process of steel manu. called the B. process (q.v.). B. profited to the extent of over a million pounds by his discovery. Among his minor inventions were gold paint and a movable die for embossed stamps.

Bessemer, tn of Jefferson co., Alabama, U.S.A., 16 m. SW. of Birmingham. It has blast furnaces, rolling mills, foundries, machine shops, etc. Pop. 28,450.

Bessemer Process, process for freeing wrought iron and low carbon steel from mechanically entangled cinder. It was first introduced in 1856 by Henry Bessemer (q.v.). By its cheapness and effectiveness, it displaced other methods, and is still widely used in Britain, the U.S.A., and other countries, especially for making rails, ship plates, boiler plates, etc.,

though other processes, such as the Siemens-Martin process, have come into competition with it. The principle of the B. P. is briefly as follows. Molten pig iron is converted into steel by having a large number of fine streams of air forced through it, causing the oxidation of its impurities, such as carbon, silicon, and often its phosphorus and sulphur. The intense heat thus generated, without the use of any other fuel, is sufficient not only to melt the iron and keep it in a molten state, but to raise its temp. to above the melting-point of steel, that is, to 1500° C. The Bessemer converter, in which this process is carried on, is an immense retort, made of boiler plates, and lined with some refractory material, such as dolomite, fire-brick, or kanister. It is suspended aloft, and mounted on axes at or near its centre of gravity. It is turned on trunnions, through the right one of which the blast is carried to the gooseneck, which delivers it to the tuyères at the bottom. There are two varieties of converters. The original one is undephosphorising, because it is lined with refractory material, such as silicic acid. The dephosphorising or Thomas Gilchrist process is the name applied when the converter is lined with basic materials. It was patented in 1878, but it is only a modification of the B. P. For further details as to the proportions of carbon, silicon, sulphur, phosphorus, manganese, and copper in the different varieties of Bessemer steel, and the character of the spectrum of the flames, etc., see IRON AND STEEL.

Bessenov, Peter Alexievich (1828-98), Russian philologist, b. Moscow; became prof. of Slavonic literature at the univ. of Cracow in 1879. He pub. many valuable works dealing with the Bulgarian and Serbian languages and literatures, and also ed. collections of popular songs and folklore of the Sorbian, Bulgarian, and Russian peoples.

Bessus (d. 328 BC), satrap of Bactria under Darius III. In 331 BC, after the battle of Gaugamela, he captured Darius, and, on being pursued by Alexander, murdered him. He was betrayed to Alexander and put to death by him.

Best, George (d. 1584?), Eng. navigator, who accompanied Martin Frobiisher in 1576, 1577, and 1578 on his 3 voyages to discover the NW. Passage. B. pub. an account of these journeys under the title, *A True Discourse of the late Voyages of Discoverie for the Finding of a Passage to Cathaya by the North-weast, under the conduct of Martin Frobiisher, Generall*, 1578. The work was trans. into French, Latin, and Italian. Copies of the *True Discourse* are rare; it was included in Hakluyt's *Voyages*, vol. III (1600). It is probable that B. was killed in a duel by Oliver St John, Viscount Grandison, about 1584.

Best (afterwards **Beate**), Henry Digby (1768-1836), writer, b. Lincoln and educ. at the grammar school there. In 1791 he took holy orders, but later was received into the Rom. Catholic Church. In 1818 he left England for a time and lived in France and Italy. His works

include *Four Years in France... preceded by some Account of the Conversion of the Author to the Catholic Faith, 1826, The Christian Religion briefly defended against the Philosophers and Republicans of France, 1793, and Italy as it is, 1828.*

Best, Thomas (c. 1570-1638), Eng. naval officer, who went to sea about 1583. In 1612, while in command of the *Red Dragon*, he defeated the Portuguese at Surat, and his victory estab. Eng. trading rights in India as equal to those of the Portuguese. In 1623 B. headed an expedition against the Dutch, who had blockaded a privateer at Aberdeen, and commanded the *Vanguard* in the unfortunate expedition to Ré, 1627.

Bestiozobanya, see BAŇSKÁ BYSTRICA. **Bestiary**, work in prose or poetry describing the appearance and habits of selected animals and basing an allegory and moral lesson upon them. The original of this type of writing was a Gk work, *Physiologus* (the naturalist), composed in the 2nd cent. AD. There were a great many trans. and imitations of it in both E. and European literature. Among the most popular on the Continent were the *Bestiaires* of Philippe de Thaon and Guillaume le Clerc, written in the 12th cent., and *Le Bestiaire d'Amour* of Richard de Fournival which parodies them. An example in O.E. is the poem of the Panther and the Whale, contained in the Exeter Book. The only complete M.E. B. is of the 13th cent. and is based on an 11th-cent. *Physiologus*. A feature of all these works is an 'unnatural natural history' derived from many sources, including Aristotle and the elder Pliny, and bringing in fabulous animals like the unicorn. The tradition survived till Elizabethan times in the fabulous references in Lyly's *Euphues*. See *The Old English Physiologus*, trans. A. S. Cook, 1922, and T. H. White, *The Book of Beasts* (trans. from a 12th-cent. Lat. B.), 1954.

Beta, 2nd letter of Gk alphabet. See ALPHABET, and B.

Beta, genus of biennial or perennial plants, native to temperate parts of the Old World, family Chenopodiaceae, about 12 species. *B. vulgaris* is the parent species of beetroot, sugar-beet, spinach beet, chard, and mangold. See BEET.

Beta Orionis, see RIGEL.

Beta Particles, high-speed electrons emitted by certain radioactive substances, and often accompanied by gamma-rays (q.v.). Rutherford (1899) found that the radiations emitted by a uranium compound were of two types, which he called alpha-rays and beta-rays (or B. P.). Whereas the former were unable to penetrate more than about 0.002 cm. of aluminium, the B. P. required about 0.2 cm. of aluminium to stop them completely. In 1900 Marie and Pierre Curie confirmed that the particles were negatively charged. In the same year Becquerel showed that they had the same ratio of charge to mass as that of the cathode rays (q.v.) or electrons, and had a velocity about half the velocity of light. Later work

showed that a given beta particle emitter produced a 'continuous spectrum' of electrons with a whole range of energies up to a characteristic maximum value. Other evidence suggested that the emission of each electron was associated with a definite amount of liberated energy. In order to explain the lower energy B. P., Pauli suggested in 1931 that each emitted electron was accompanied by a hitherto unsuspected particle which came to be known as the neutrino (q.v.).

The positive charge of the nucleus is increased by one unit by beta emission and the resulting nucleus is therefore that of a different chemical element. If this resulting nucleus is formed with more energy than it normally possesses, i.e. if it is formed in an 'excited state', the excess energy is given up almost immediately as a photon (q.v.) and gamma-rays are emitted. There is a small but definite probability that the emitted photon will interact with the electrons surrounding the nucleus and cause one of them to be ejected. The process is known as 'internal conversion' and is essentially a photo-electric effect (q.v.). The energy of the photon is characteristic of the excited nucleus and as a result the ejected electron has a definite energy, which is often of the same order as that of the 'continuous spectrum' of B. P. discussed earlier. Therefore a 'line spectrum' due to internal conversion is frequently superimposed on the continuous beta particle spectrum.

The term beta particle is applied to all fast electrons whether they arise from radioactive sources or not. The betatron (q.v.) is a machine designed to produce electrons with energies far in excess of those encountered in radioactivity. High energy electrons are also found as the result of the interactions of cosmic rays (q.v.). High energy positrons (q.v.), i.e. positive electrons, are sometimes called positive B. P. They are emitted by some artificially produced radioactive nuclei, whereas all natural beta-active nuclei emit negative electrons. Positive B. P. are also formed in cosmic ray interactions. See RADIOACTIVITY.

Beta Persel, see ALGOL.

Beta Rays, see BETA PARTICLES and RADIOACTIVITY.

Bettaine (Lat. *beta*, beet), chemical formula $C_5H_{11}NO_3$, called also trimethylglycine B., occurs as a natural alkaloid in beetroot, in mangel-wurzel, in the leading branches of *Lycium barbarum*, and in putrefying flesh. It has the constitution trimethylglycine, and can be obtained by the oxidation of choline hydrochloride. Choline occurs in the bile and brain of animals, and also in the white of eggs. B. can be obtained as a hydrochloride synthetically by heating trimethylamine, $(CH_3)_3N$, with monochloroacetic acid, $^1H_2Cl.CO.OH$. It crystallises from alcohol in shining deliquescent needles containing a molecule of water. It is neutral, has a sweet taste, and is decomposed by boiling alkalis or baryta. It may also be prepared by boiling diluted molasses with baryta, and, in the later stages of the

process, removing the barium from the filtrate by H_2SO_4 , the B. hydrochloride crystallising in evaporation.

Betanzos (anct *Brigantium Flavium*), Sp. in the prov. of La Coruña, on a hill between the R.s Mandeo and Mende. It has many fine anct buildings, is the depository of the Galician archives, and was once an important port. Pop. 11,000.

Betatron, machine to produce high-energy electrons, i.e. beta particles (q.v.), first designed and constructed by D. W. Kerst in the U.S.A. in 1940. The basic principle is electro-magnetic induction and its use was proposed by R. Wideröe in Germany in 1928. A changing magnetic field is always accompanied by an electric field which can be used to accelerate electrons—this is the principle underlying the action of an electrical transformer. An electron moving at right angles to a magnetic field is caused to move in a circular path. By careful design the changing magnetic field can be used to make the accelerating electrons travel in a circle of constant radius around which the accompanying electric field is acting. The machine consists of an electro-magnet with specially shaped circular pole pieces which is energised by an alternating current. Between the pole pieces is placed a hollow ring, known as a 'doughnut,' which is highly evacuated. Electrons from a hot cathode are injected at high velocities into this doughnut just after the magnetic field has begun to increase. They are accelerated by the accompanying electric field and travel in circles, making up to 1 million revolutions before the magnetic field reaches its maximum value, at which time they are deflected by a superimposed magnetic field. By this means they can be extracted for experimental purposes or allowed to strike an internal target in order to produce high-energy X-rays, i.e. gamma-rays (q.v.). Electron energies can be obtained equivalent to an acceleration under the action of some 300 million volts. At this energy the electron velocity is over 99.99 per cent of the velocity of light, and the relativistic increase in mass is so great that the electron mass is nearly 600 times the 'rest mass,' i.e. its mass when it is effectively at rest.

Betel-nut Palm (*Areca catechu*), tree indigenous to Malaysia, but cultivated also in S. India, Ceylon, Siam, and the Philippines. It grows about 50 ft high, branchless, but bearing a crown of large fronds. The fruit, nearly the size of a hen's egg, contains the nut used by Asiatics for mastication. Gathered and husked before they are fully ripe, the nuts are then boiled, sliced, and sun-dried. Each piece for chewing is wrapped in a leaf of the betel pepper-vine, with some lime and often an aromatic flavouring. The betel reddens the mouth and blackens the teeth, but preserves them.

Betelgeuse, or Alpha Orionis, bright star situated in the E. shoulder of the constellation of Orion. It is a long-period variable of about 196 days during which it declines in magnitude from 1.0 to 1.4.

B. is the brightest star in Secchi's third type, i.e. it is reddish in colour and of a comparatively low temp. The spectro-scope reveals the presence of sodium, magnesium, and iron in its composition, but no hydrogen. B. has a small parallax, 0.012", which means that it is very remote, its distance exceeding 270 light-years. Its brilliancy exceeds that of the sun many hundred times, and it is estimated that it is receding from the solar system at the rate of 15 m. a second. The interferometer (q.v.) has shown that its diameter varies between 210 and 300 times the sun's diameter.

Beth. see **BEIT**.

Bethany: 1. Vil. of Jordan 2 m. ESE. of Jerusalem. It is called Elzariya, for it was the residence of Lazarus and his sisters. The only object of interest is the supposed tomb of Lazarus. Of the ecclesiastic buildings erected about the 4th cent. little or no trace is existing. It is situated on the Mt of Olives at a height of 2208 ft above sea level. Pop. 200.

2. Vil. in Orange Free State prov., S. Africa, the site of a mission station (altitude 4539 ft), 411 m. from Port Elizabeth.

Bethel, 'house of God,' pile of ruins now called Beitin, situated about 11 m. N. of Jerusalem. It was the scene of Jacob's dream, and was formerly known as Luz. Abraham stayed here, and later the ark of the covenant was deposited in its precincts. Still later it became a royal residence and a centre of heathen worship. Pop. 500.

Bethell, Richard, see **WESTBURY**, 1st BARON.

Bethesda: 'House of Mercy' (the name is uncertain in the texts): 1. A public bath of Jerusalem, where Christ healed the Impotent man. Birkit Israel, situated in Jerusalem, has been identified with it since the year 1102. It is in that part of the city near the gate of St Stephen and Omar's Temple. Other sites are suggested by Condor, who claims it to be the spring called Gibon and En Rogel in the Kedron valley; and Schiek who, in 1889, discovered remains of an oblong pool near St Anne's Church, with 4 lateral porches and a fifth central dividing porch.

2. Tn of Caernarvonshire, Wales, 4 m. SE. of Bangor. It derives its name from the local Nonconformist chapel. The Penrhyn quarries near by yield large quantities of slate, which are shipped from Bangor. Pop. 4500.

Beth-horon, Upper and Lower (modern Beit 'Ur et Teahtha and Beit 'Ur el Foka), two vils. of Palestine, 10 m. NW. of Jerusalem, on frontier between Benjamin and Ephraim. Joshua defeated the Amorites in the pass between the two (see Joshua x. 1-11), and Judas Maccabaeus defeated the Syrians here in 166 bc.

Bethlehem: 1. The modern Beit Lahm, 5½ m. S. of Jerusalem, 2350 ft above sea level; it is reached by a main road which passes, after 4 m., the tomb of Rachel. B. stands on a high, narrow ridge, and is a typical old Jewish tn of biblical times. Its structure explains many phrases descriptive of it in the Bible; thus

external stairways still lead to the flat roofs, while the roofs are often conjoined so as, in effect, to facilitate flight from one dwelling to another. It has no natural springs, but wheat, olives, etc., grow in its neighbourhood, and its wine is excellent. It was David's home, the scene of Ruth's encounter with Boaz, and above all the bp. of Jesus Christ. Christian pilgrimages began before AD 132. In AD 326 Constantine built a basilica over the grotto stable of the Nativity where, in 1099, the crusaders raised their standard and Baldwin I was crowned King of Jerusalem. In 1244 the Khwarizmians,

historical description; *The Church of the Nativity at Bethlehem*, by W. Harvey, W. R. Lethaby, and others, 1910, an illustrated architectural and descriptive survey; *Bethlehem: le sanctuaire de la Nativité*, by Vincent and Abel, 1914, a fully documented historical and archaeological study, written prior to recent important discoveries, now supplemented by articles in the *Revue biblique*, 1936, 1937; *Structural Survey of the Church of the Nativity, Bethlehem*, by Wm Harvey, 1935, a fully illustrated architectural survey of the then condition of the church, including a record of archaeological dis-



For Photos

BETHLEHEM

Terraces and the Church of the Nativity.

who had conquered both Christians and Muslims, devastated it, and in 1489 it was again destroyed and became a ruin. It is now a small country town with a pop. largely Christian, and devout and hospitable. The church of the Nativity, the oldest Christian church still in use, is the original basilica built by Constantine, partly restored by Justinian in the 6th cent. The roof was repaired in the 15th cent. with lead sent by Edward IV of England. The church is now shared by sev. communities. The grotto of the Nativity lies beneath the choir; on the E. side is a semicircular recess in which a silver star indicates the spot where Christ was b. with the inscription: 'Hic de Virgine Maria Jesus Christus natus est.' A few m. to the S. of B. the reservoirs, known as the Pools of Solomon, have been brought into use with other ancot sources of supply at Arrub.

Pubs. dealing with the hist., archaeology, and architecture of B.: *Les Eglises de la Terre sainte*, by Count Melchior de Vogüé. 1860, the classic architectural and

coveries; *Excavation in the Atrium of the Church of the Nativity, Bethlehem*, by R. W. Hamilton; *Basilica of the Nativity, Discovery of the Remains of an Earlier Church*, by E. T. Richmond.

2. Post-bor. in Northampton and Lehigh cos., Pennsylvania, U.S.A. It is situated on the R. Lehigh, and is connected by rail with Philadelphia, 55 m. distant. The Moravians founded the tn whose inhab. are still mostly of that sect. Clothing, textiles, electrical equipment, metal products, coke, furniture, cement, and chemicals are its chief products. It is joined to S. B. by two bridges across the Lehigh, and to W. B. by Monocacy Creek. Total pop. 66,340. S. B. is a centre of the steel and iron industry. Here are located some of the chief works of the B. Steel Corporation (q.v.). In Nov. 1915 a fire, attributed to Ger. agents, caused a loss of material worth £250,000. B. is the seat of the important Lehigh Univ. and Moravian college. An ann. Bach festival is held.

4. Tn of Orange Free State, S. Africa,

125 m. NE. of Bloemfontein, in an agric. region, with an excellent climate and an important railway junction. Pop.: Whites 7491; Bantu, 11,062; others, 446.

Bethlehem Hospital, *see* BEDLAM.

Bethlehem Steel Corporation, incorporated under perpetual charter in New Jersey in 1904, since when it has acquired control of extensive iron, coal, shipbuilding, and other interests. The corporation has steel and manufacturing plants at Bethlehem, Steelton, Lebanon, Johnston, and Coatesville in Lackawanna, Wilmington, Seattle, and San Francisco. Its chief products are pig-iron, ferro-manganese, spiegeleisen, iron and steel bars, slabs, guns, ammunition, bridges, viaducts, etc. Its shipbuilding and repair plants are at Quincy, Sparrow's Point, Baltimore, Alameda, San Francisco, San Pedro, and Boston.

Bethlehemites, name of various societies as follows: 1. Order of monks who d. in England during the 13th cent., and who founded a monastery at Cambridge, 1257.

2. Military order founded by Pope Pius II to prevent an attack by the Turks in 1453.

3. Society of Hospitallers of Guatemala, founded in 1659 and patronised by Pope Innocent XI in 1687.

4. Bethlehem Church in Prague gave the name also to its followers who were led by John Huss.

Bethlen, Gabor (1580-1629), Prince of Transylvania, member of an ancient Hungarian Calvinist family. He was chosen prince on the murder of Gabriel Báthory, his former friend, in 1613. When the Thirty Years War began B. invaded Hungary proper as an ally of the Bohemians, and was proclaimed King of Hungary in 1631. Later, on making peace with the Emperor Ferdinand II, B. relinquished the title of King of Hungary, though he gained extensive territories and the title of Prince of the Empire. This did not prevent him from again intervening in the war against the emperor.

Bethlen, Stephan, Count (1874-1947), Hungarian politician, of an old Protestant Transylvanian family. He was educ. at Vienna and Budapest Univs. In 1901 he entered the Hungarian parliament as a Liberal, but refused Tisza's offer of a place in the gov. After the First World War, when Bela Kun (q.v.) headed the Communist revolution, B. was a leader of the successful counter-revolution. In 1921 he became Prime Minister. He settled the W. frontier amicably with Austria, and in 1923 he succeeded in obtaining suspension of the reparations order against Hungary, and a loan from the League of Nations. In 1927 he signed a treaty with Fascist Italy. He was Prime Minister for 10 years from 1921, and, after that, leader of the opposition. He later refused to co-operate with the Nazis.

Bethmann-Hollweg, Theobald Theodor Friedrich Alfred von (1856-1921), Ger. statesman, b. Hohenknov, Eberswalde. B.-H. studied law from 1875 to 1879, Strasburg, Leipzig, and Berlin,

and then occupied various posts in the civil service. In 1901 he became president of Brandenburg Prov., and vice-president of the Prussian ministry of state, and secretary of state for the interior, 1907. In 1909, on the resignation of von Bülow, B.-H., although he had little experience of foreign affairs, was appointed imperial chancellor. His domestic policy was liberal in tendency; but he is best remembered for his part in the events leading to the beginning of the First World War. It was B.-H. who made the historic speech on 4 Aug. to the Brit. ambas. in Berlin: 'Just for a word, "neutrality"—a word that in wartime has so often been disregarded—just for a scrap of paper, Great Britain is going to make war on a kindred nation, which desires nothing better than to be friends with her.' B.-H. was disliked by the militarists in Germany, and resigned in 1917. He d. at Hohenknov. His *Betrachtungen zum Weltkriege* were pub. between 1919 and 1921.

Bethnal Green, parl. and metropolitan bor. of E. London. In the Middle Ages the bishops of London had a residence here, demolished in 1845. In the late 17th and early 18th cents. many Huguenots came here from their neighbouring settlement of Spitalfields (q.v.), and encroachment from London began. In the 19th cent. B. G. was London's worst slum area. In 1872 a branch of the Victoria and Albert Museum was opened here. The prin. industry is cabinet-making, but matchbox- and boot-making are also carried on, and there is a street market. The bor. returns one member to Parliament. Area 760 ac.; pop. 55,500.

Bethphage (Kefr et Tur), vil. high on the E. side of the Mt of Olives, between Bethany and the summit, through which the road from Jerusalem to Jericho passed (Matt. xxi. 2).

Bethsaida (modern et-Tell), vil. on the W. shore of Lake Galilee, on the E. bank of Jordan as it enters the lake. It was the bp. of Peter, Andrew, and Philip, and on the plain around it Christ fed the 5000. Nothing now remains save a pile of grass-covered ruins. It was named Julius by Philip the Tetrarch, after a daughter of the Emperor Augustus.

Bethshan, *see* BEISAN.

Beth-shemesh: 1. Ancient city of Palestine, probably the modern Ain Shems, a vil. 15 m. SW. of Jerusalem. Frequently mentioned in the O.T. as a city of N. Judah, between Kirjath-jearim and Timnah, originally a Levite city and later the chief city of Dan. Jehoshaphat, King of Israel, captured Amaziah, King of Judah, here. *See* Joshua xxi. 16, and 2 Kings xiv. 11.

2. City of Naphtali, Upper Galilee. *See* Joshua xix. 38.

3. City of Issachar. *See* Joshua xix. 22.

4. Temple of On (Heliopolis), Lower Egypt. *See* Jer. xliii. 13.

Bethune, Cardinal David, *see* BEATON.

Bethuns, Edward Cecil (1855-1930), Brit. soldier. He entered the Royal

Artillery in 1874 and a Highland regiment in 1875. He attained the rank of major-general in 1908. He served in the Afghan war, 1878-80, and in the Boer wars of 1881, and 1899-1902; for the last-named war in S. Africa he raised and commanded B.'s horse. After that war he commanded the SE. Sub-Dist., Cape Colony. Promoted to lieutenant-general in 1913. Was director-general of the Territorial Force, 1912-17. Retired 1920.

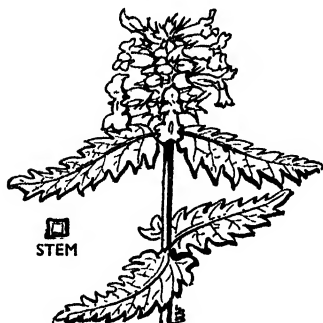
• Bethune, James, see BEATON.

Bethune, Maximilien de, see SULLY.

Bethune, Fr. tn, cap. of an arron., in the dept of Pas-de-Calais. It dates from the 11th cent. but did not finally come under Fr. rule until ceded to Louis XIV in 1678 by the treaty of Nijmegen (q.v.). It was severely damaged in both world wars. The church of St Vaast is partly 13th cent., and there is a magnificent 14th-16th-cent. belfry. B. is the centre of a coal-mining area, and manufs. beet sugar and textiles. Pop. 22,100.

Bethylus, in entomology, genus of small hymenopterous insects of the family Proctotrypidae. The species are four-winged flies remarkable for their large depressed heads, and somewhat resemble ants in appearance. They are found chiefly in dry and sandy situations.

Bethylus, in ornithology, genus estab. by Cuvier and placed among the Laniidae, butcher-birds or shrikes (q.v.). The species described by him is a native of Guiana and Brazil, and is particoloured, black and white, like the common magpie.



Betony (*Stachys officinalis*), plant of the Labiatae family. It is found in Great Britain in damp shady places, in hedgerows, woods, etc. The leaves are long, with toothed edges, and the blossoms, which appear in July and Aug., are of a purple colour. It was formerly regarded as a medicinal herb. It can be used to extract a kind of yellow dye.

Betrothal (A.-S. *treoweth*, truth), term signifying pledging oneself to marry, i.e. giving one's troth. It was anciently a more formal ceremony than it is to-day,

having most of the binding force of a marriage. Rom. law (*sponsalia*) imposed the duty on betrothed persons to become husband and wife in a reasonable time, except where death intervened. The custom was practically abolished in the Christian Church by the Council of Trent, because it so frequently led to clandestine marriages; but subsequently B.s became common again on the Continent. Since a B. is a legal contract, it is valid only between parties whose capacity is recognised by law, as, for instance, the persons must be of age. B.s induce a strict obligation to marry, and should either party eventually refuse, the other may obtain damages in an action for breach of promise. B. as a term of art in Eng. law has fallen into disuse, it being rather the mere promise to marry than any formal B. that gives rise to the legal obligation.

Betsileo, S. part of the central plateau of Madagascar, inhabited by the Betsileos, numbering 470,000. Cap. Fianarantsona.

Betterment, term used to describe the additional value a tenant has caused his landlord's land to possess. See also FIXTURES and LANDLORD AND TENANT.

Betterton, Thomas (1635-1710), leading actor of his time, b. Westminster, son of an under-cook in Charles I's household, apprenticed to Rhodes, a bookseller of Charing Cross, who had been wardrobe-keeper to the theatre in Blackfriars. In 1659 Rhodes obtained a licence to form a company of players at the Cockpit, Drury Lane, and here B. made his first appearance on the stage. In 1662 Sir Wm Davenant, patron of the new theatre in Lincoln's Inn Fields, engaged B. and all Rhodes's company to play in his *Siege of Rhodes*. B. became so great a favourite of the king that he was sent to France to make improvements in the Fr. theatres. Cibber says that it was after B.'s return that shifting scenes first replaced tapestry on the Eng. stage. In 1670 B. married Mrs Sanderson, a capable actress of the same company. B. left Drury Lane and went to Lincoln's Inn Fields in 1695, playing Valentine in Congreve's *Love for Love*. He lost his money in an unfortunate trading venture and had to continue acting almost up to the day of his death. He was one of the best actors ever seen on the Eng. stage. His performance of Hamlet after this time was especially noteworthy. In 1710 he made his last appearance in his celebrated part of Melantius in *The Maid's Tragedy*. He d. in the same year and was buried in the cloisters of Westminster Abbey. He wrote sev. dramatic works which had a vogue in his day. See *An Apology for the Life of Mr Colley Cibber, Comedian*, 1740, 1879, and R. W. Lowe, *Thomas Betterton*, 1891.

Bettinelli, Saverio (1718-1808), It. historian, critic, and poet. He was a Jesuit, teacher of rhetoric, and admirer of Voltaire. His chief work is the *Risorgimento d'Italia*, 1775, a hist. of It. civilisation in the Middle Ages. He also wrote a tragedy, *Serse*, and a well-known letter attacking Dante, *Lettere di Virgilio*, 1757.

Betting, act of staking money on the result of some future event, usually of a sporting nature, but not necessarily so. The word is supposed to be derived from the Old Fr. *abeter*, to instigate. The origin of the custom is not exactly known, but it dates back to the very earliest days, especially in E. countries. By far the largest part of B. in England takes place over horse-racing, and the men who make a profession of taking bets are known as bookmakers. Up to the early part of the 19th cent. none of these existed, as such, but the first man to take bets in a really scientific and business-like manner was Wm Ogden in 1793, who can be called the first proper bookmaker. B. is illegal except at properly authorised race-meetings, and then it must be in Tattersall's Ring. The B. is of two kinds: post B., when the wagering begins when the numbers of the horses are hoisted on to the board just before the race, and ante-post B., when the wagering takes place weeks before the event. Bets on all big races, such as the Derby, the Oaks, the St Leger, the Cambridgeshire, or the Cesarewitch, often take place nearly a year previous to the race-meeting. Bets are quoted in most newspapers, and as the public take them up so the prices are regulated. The theory of B. is simple, but in practice it is more complicated. The bookmaker will make a book for a certain amount, say £50, £100, or £1000, and his endeavour is to lay an equal amount of his book against every horse in the race. The odds, of course, change with the current quotations of each horse. (For further details see Tattersall's *Rules on Betting* and Rowntree's *Betting and Gambling*.) Bookmakers who wish to carry on their business otherwise than at race-meetings are styled 'commission agents,' and profess only to take money on behalf of others. The Betting Acts of 1853 and 1874 were made to prevent bookmakers having too much power, while the Gaming Act (see GAMING) was designed to check the evils attendant on this custom. The Betting Acts above mentioned enforce that 'no house, office, room, or other place' shall be resorted to for the purpose of B. The word 'place' has been held to mean even an umbrella or stool belonging to a bookmaker at a race-meeting who is outside Tattersall's ring. B. debts cannot be recovered in a court of law. Welshing is the term given to the practice on the part of a dishonest hook-maker of disappearing with the stake-money before a race. The laws on street B. are severe, especially upon those making books with persons under the age of 16. For the first offence any one taking bets in a public place is fined £10; for the second offence, £20; and for the third offence, £50 or six months, and so on, according to the number of convictions. Among some of the famous bets that have taken place may be mentioned that of Lord George Bentinck, who won £20,000 when Crucifix won the Oaks in 1840, and 3 years later the same nobleman stood to win £150,000 if his horse Gaper had won the Derby; the horse lost, but Lord George

won £30,000 on another horse. John Gully and Ridsdale won £100,000 over the Derby and the St Leger in 1832, and Sir Joseph Hawley won £80,000 when Beadaman won the former race in 1858. Lord Glasgow once laid £90,000 to £30,000 with Lord George Bentinck. Capt. Machell gained over £60,000 when Hermit won the Derby, while over the same race the notorious plunger, the Marquess of Hastings, lost the enormous sum of £103,000. The totalisator system of B. is now in operation on many racecourses in England. This system was first used in France, the apparatus being known as the *pari mutuel*. It is a large frame with a pigeon-hole for each horse, into which the stakes are placed; the better obtains a voucher for his money, and the numbers are exhibited after the race. The Fr. municipal authorities deduct a certain percentage from the stake-money, and another percentage is also set aside for the poor before the money is divided up amongst the winners. This system was introduced into France in 1856, and a few years later into England, where, however, it did not find favour, and was soon abolished and declared illegal as being a gaming machine. The difference between the 'tote' and the *pari mutuel* is that the former is operated automatically by electricity. Both the *pari mutuel* and totalisator systems again came into favour in Great Britain and were legalised by the Racecourse Betting Act, 1928. Such B. is controlled, under the Act, by a board of control. The system is also used in the dominions.

Wagers are a form of B. not usually associated with the race course, but are a hazard on any event, sporting or otherwise, sometimes on things of an absurd nature. Lotteries, another method of B., take the form of taking tickets for small or large amounts on the chance of winning big sums of money. The earliest lottery properly estab. was one in Florence in 1530, and in 1671 a special official was appointed in Venice to supervise these affairs. From Italy the lottery passed into France and gradually spread over Europe. The first one known in England was at the end of the 17th cent. Lotteries are, subject to certain exceptions, illegal in England, however, although they still flourish on the Continent, where they are sometimes run by the states, in fact, Austria, Denmark, and Prussia have raised loans by this means. In America, as in England, they are now forbidden by law. The Betting and Lotteries Act 1934, restricts B. by totalisator and bookmaker to 104 days on any racing track; regulates greyhound racing and authorises the estab. of totalisators on dog tracks; bans all lotteries, with the exception of certain small private ones organised by clubs and other institutions; prohibits the pub. of lottery advertisements, 'matter descriptive' of the drawing of lotteries, and lists of prize-winners; and imposes penalties ranging from a fine of £50 to a fine of £750, or 2 months' imprisonment to a year's imprisonment. The pub.

of matter descriptive of the drawing or intended drawing of a lottery is only an offence if it is 'calculated to act as an inducement.' A justice of the peace, before issuing a search warrant, must be satisfied that premises are being used for the sale or distribution of lottery tickets. In connection with trafficking in lottery tickets, and, in particular, in Irish Sweepstake tickets, the gist of the offence is the sale and distribution of tickets in Great Britain. It is not an offence for an individual to send money to Dublin for tickets for himself; but if the individual were to sell the tickets to someone else, or to hand money on to another person for the purpose of purchase, that would be an offence under the Act. (See also LOTTERY.) The gaming-table is also a popular form of B.; this is now also illegal in England, though in 1920 it was licensed in London and was popular in the 18th cent., but in the early part of last cent. the games of faro, basset, hazard, and roulette were prohibited. Gaming continued, however, to be in vogue at many of the health resorts on the Continent, but only quite small sums are allowed to be staked at one time, generally not exceeding 5 Swiss frs. Ostend has a large kursaal with many tables, and although officially abolished in France in 1838, gaming-tables for the small amounts alluded to above are still to be found at places like Dieppe and Boulogne. Baden-Baden, the famous watering-place, and Homburg, the Prussian spa, were at one time two of the most famous resorts in Europe of gamblers. Since the suppression of the gambling facilities of most of these places, Monaco is the only European state where gambling on a large scale is lawful. See MONTE CARLO; TOTALISATOR; POOL.

Betting Tax, tax on bets laid with book-makers imposed under the Finance Act of 1926 by the Conservative Gov. when Winston Churchill was chancellor of the exchequer. Certain duties were levied on and after 1 Nov. 1926; but they were shortlived, as the tax was abolished by the Labour Gov. in 1930. The Finance (No. 2) Act, 1947, imposes on pool betting promoters a tax on the net proceeds of money staked. See also GAMBLING; HORSE-RACING; LOTTERY.

Bettws-y-coed, urb. dist. of Caernarvonshire, Wales, situated 4 m. from Llanrwst and 16 from Llandudno. Its name signifies house of prayer (from O.E. bede-house) of the wood. Artists and tourists are attracted to the spot. Fishing for trout and salmon yields large results. Among its waterfalls the best known are the Swallow Falls, Conway Falls, and Fairy Glen. Pop. 780.

Betty, William Henry West (1791-1874), actor; popularly known as the 'young Roscius.' He was b. at Shrewsbury, Shropshire, and first appeared on the stage at the age of 12 as Osman in *Zara* by Aaron Hill, which was Voltaire's *Zaire* in English. Spontaneous success led to a journey to Dublin. While there he is said to have memorised the part of Farnet in 3 hours. The House of

Commons was adjourned by Pitt one night to allow members to attend a performance where he was appearing. He made his last appearance as a boy actor in 1808; was a fellow commoner at Christ's College, Cambridge, from 1809 to 1811; returned to the stage in 1813; retired in 1824 to enjoy the fortune he had amassed.

Betula, generic name of the birch (q.v.). **Betulaceae**, family of dicotyledonous trees or shrubs found largely in N. lands. It comprises 6 genera, *Alnus*, *Betula*, *Carpinus*, *Corylus*, *Ostrya*, and *Ostryopsis*. **Betuwe**, dist. of the Netherlands, situated between the R.s Waal and Rhine, in the prov. of Gelderland. It is very fertile and has many orchards.

Beule, Charles Ernest (1826-74), Fr. archaeologist and politician, b. Saumur. He became prof. of archaeology at Athens, where he rediscovered the propylaea of the Acropolis. He was author of numerous works on archaeological subjects, including *L'Acropole d'Athènes* (2 vols.), 1854.

Beurnonville, Pierre de (1752-81), Fr. general under the rep., b. Champignolle.

Beust, Friedrich Ferdinand, Count von (1809-86), Austrian statesman, b. Dresden; descended from a distinguished and noble family who had been connected with the Mark of Brandenburg. Educ. at Leipzig and Göttingen, he entered the public service of Saxony. He was the champion of the minor Ger. states against Prussian hegemony; but is best remembered for his efforts which brought to a successful issue the negotiations for the *Ausgleich* between Austria and Hungary. He was Austrian ambas. in London, 1871; in Paris, 1878.

Beuthen, see BYTOM.

Beuvry, Fr. tn in the dept of Pas-de-Calais. It has coal wharves on the B. canal. Pop. 6300.

Beuzeville, Fr. tn in the dept of Eure. It has distilleries. Pop. 2400.

Bevagna, It. mkt tn, in Umbria (q.v.), 18 m. SE. of Perugia (q.v.). It has a trade in wine. Pop. (com.), 7000.

Bevan, Anselm (1897-), politician, b. Tredegar, Mon., the son of a miner, and educ. at Serhowey Elementary School and the Central Labour College. At 13 he went to work in the mines and soon became an active and militant trade unionist. He has been Labour Member of Parliament for Ebbw Vale since 1929. His views were always on the left of his own party and he gained public notoriety for his ardent criticisms of the war-time Coalition Gov. of which his own party leaders were members. From 1945 to 1951 he was minister of health. During his term of office the National Health Service was estab. In 1951 he was appointed Minister of Labour, but resigned on a disagreement of policy with the gov.

In Opposition after 1951, B.'s criticisms of his own party's policy caused Labour considerable embarrassment, and at times a split in the party seemed imminent, B.'s more extreme views having wide support among the constituency organisations. In Mar. 1955 the Labour Whip was withdrawn from B.;

it was restored the following month; in June, after Labour's defeat in the general election, B. was re-elected to the Labour 'Shadow Cabinet.' Subsequently, his position within the Labour party has grown considerably more secure: he gained second place in the elections for leadership of the parl. Labour party, held Dec. 1955, and in Oct. 1956 B. was overwhelmingly elected treasurer of the Labour party (having stood, unsuccessfully, on previous occasions. He was re-elected in Oct. 1957. He wrote *In Place of Fear*, 1952.



Camera Press

ANEURIN BEVAN

Beveland, North and South, two is. in the Scheidt estuary, Netherlands. They are of the Zeeland is., of which group S. B. is the largest and most fertile. It has a pop. of 60,500. N. B. is a low marshy tract. Some of the protecting dikes were breached by heavy floods in Feb. 1953.

Beverages, see COOKERY.

Beveren, in the prov. of E. Flanders, Belgium; noted for the manuf. of point-lace. It contains a famous church, parts of which date back to the 12th cent. Pop. 13,500.

Beveridge, William (1637-1708), Bishop of St Asaph, studied the classical and Semitic languages as sizar of St John's College, Cambridge. In 1661, having obtained his M.A. degree, he was ordained deacon and priest. Before finally accepting his bishopric in 1704 he refused that of Bath and Wells. Piety and devotion

distinguished him through all his preferences. In 1824 9 vols. of his sermons and other writings were pub. His *Private Thoughts upon Religion* was pub. in 1709.

Beveridge, William Henry, 1st Baron Beveridge of Tuggal (1879-), leading economist, b. Rangpur, Bengal, son of Henry B. of the Indian Civil Service, educ. at Charterhouse and Balliol College, Oxford; Stowell Civil Law Fellow of Univ. College, Oxford, 1902-9. Leader-writer for the *Morning Post*, 1906-8; member of the Central Unemployed Body for London, 1903-8, and first chairman of Employment Exchanges Committee. Entered the Board of Trade in 1908, and was director of labour exchanges, 1909-16; then assistant secretary in charge of Employment Dept. Director of London School of Economics and Political Science, 1919-37, then Master of Univ. College, Oxford, 1937-45. He holds degree of D.Sc.(Econ.), London, 1930, and was a senator of London Univ., 1919-1937, and again, 1944-8, vice-chancellor, 1926-8. From 1941 to 1943 he was president of the Royal Statistical Society. He has served as chairman of various social service committees, notably, since 1934, of the Unemployment Insurance Statutory Committee, and, during 1941-1942, of the Inter-Departmental Committee on Social Insurance and Allied Services. This body was formed as a committee of experts, including the gov. actuaries and representatives of many gov. depts., to undertake a survey of the existing national schemes of social insurance, including workmen's compensation, and to make recommendations. The outcome of these labours was the celebrated report made by B. as chairman, and signed by him alone. It was pub. by the Stationery Office under the title of *Social Insurance and Allied Services* (Cmd. 6404 of 1942). Its main feature was a far-reaching scheme of social insurance against 'interruption and destruction of earning power and for special expenditure arising at birth, marriage, or death.' The plan was intended to cover the whole community, without upper income limit, and embodied 6 fundamental principles: namely, 'flat rate of subsistence benefit; flat rate of contribution; unification of administrative responsibilities; adequacy of benefit; comprehensiveness; and classification.' It provided for the conditions of unemployment and disability benefits, retirement pensions, training benefits, maternity grants, children's allowances, widows' allowances, and recommended a national health service organised under the health depts, while at the same time advocating the creation of a Ministry of Social Security to unify the administrative work of the whole scheme. The report, which was the basis of subsequent legislation, created a widespread interest at the time of its pub., and summaries of it were broadcast to the world. Apart from its merits, it was held to symbolise the stability and confidence of Great Britain by showing that, during the course of a world war, in which its

existence was at stake, the country could nevertheless concern itself with plans for the betterment of social conditions. K.C.B., 1919; raised to the



E.N.A.

LORD BEVERIDGE

peerage in 1946. Other works pub. by B. are: *Unemployment: a Problem of Industry*, 1909 (new ed., 1930); *Insurance for All*, 1924; *British Food Control*, 1928; *Causes and Cures of Unemployment*, 1931; *Planning under Socialism*, 1936; a pamphlet, *The Unemployment Insurance Statutory Committee*, 1937; *Full Employment in a Free Society*, 1944; a book about his father and mother, *India Called Them*; 1948; *Voluntary Action*, 1948; *Power and Influence* (autobiography), 1953.

Beverley, John of (14th cent.), Carmelite friar; he was doctor and prof. of divinity at Oxford and wrote *Quaestiones in Magistrum Sententiarum* and *Disputationes Ordinariae*.

Beverley, St John of (d. 721), ecclesiastic, b. Harpham, Yorks, was for 33 years Archbishop of York, and ordained the Venerable Bede. He founded B. Abbey. After his death he was canonised, and William the Conqueror spared the tn of B. when he ravaged the rest of Yorks. Among his works are *Pro Luca Exponendo*, addressed to Bede, and sev. epistles. His feast is on 7 May.

Beverley, municipal bor. of Yorks, England, cap. of the E. Riding of the co., 8 m. NNW. of Hull city, and connected with the R. Hull by canal. B. Minster (13th cent.) occupies a unique position in Gothic eccles. architecture; it contains the Percy tomb (c. 1350) with its masterly sculpture. St Mary's par. church dates from the 14th cent. The grammar

school is of such antiquity that its date of foundation is unknown. B. is an agric. centre with a flourishing cattle market. Leather tanning, shipbuilding, manuf. of motor-car accessories, and metal plating are the chief industries. Pop. 15,500.

Beverly, tn of Essex co., Massachusetts, U.S.A. It is situated on an inlet of the Atlantic opposite Salem. By rail it is 18 m. NE. of Boston. Its importance is due to its harbour, its fisheries, and large manufs. of shoes, shoe machinery, canvas, and clothing. Pop. 28,900.

Beverwijk, small tn in the prov. of N. Holland, 7 m. N. of Haarlem. It has extensive strawberry growing. Pop. 30,585.

Bevin, Ernest (1881-1951), politician, b. Winsford, Somerset. As a boy he worked as a farm labourer. He was for many years general secretary of the Transport and General Workers' Union, being popularly known as the Dockers' K.C. He was appointed chairman of the General Council of the Trades Union Congress in 1937, and was made M.P. (Labour) for Central Wandsworth from 1940 to 1950, and then, till his death for E. Woolwich. When Winston Churchill formed his coalition gov. in May 1940, B. was asked to be minister of labour, and it fell to him, at a difficult time, to



B.B.O.

ERNEST BEVIN

mobilise the man-power of the country without so straining the principle of industrial conscription as to excite the hostile criticism of the left-wing elements in the country. In this he was outstandingly successful. On Labour's being returned to power in 1945 B. became foreign secretary in Attlee's gov. He

soon became a figure of international importance, his blunt speeches attracting considerable attention. B. was a strong supporter of the U.N.O., and a firm believer in blocking any aggressive Soviet intentions; but he always asserted, with obvious sincerity, that he was in no sense anti-Russian. He was, however, frequently criticised as such by more left-wing members of his own party. In 1946 B. was made an honorary citizen of Missolonghi as a token of gratitude for his services to Greece—an honour which was awarded to Lord Byron in 1824. In 1947-8 he was one of those primarily responsible for the conception of a W. European pact by way of counteracting the gradual westward infiltration of Russian Communist influence. A W. European treaty, valid for 50 years, finally took shape at the Brussels conference in March 1948. (See BRUSSELS TREATY, 1948.) In Sept. 1948 B. made a speech embodying the idealism on which his foreign policy was fundamentally based: 'Let us open up our countries to inspection, all of us: let us open up the world; let light and knowledge come in'—and he looked forward to the day when individuals would be able to travel freely wherever they wanted, without the need of visas or passports. B.'s ill health became increasingly obvious, and he resigned the foreign secretaryship a month before his death, being appointed lord privy seal. See life by T. Evans, 1946. His speeches and broadcast addresses were pub. in 1942 under the title *The Job to be Done*.

Bevis of Hampton, prin. character of an Eng. medieval romance. His father was Sir Guy, Earl of Hamptoun (Southampton). On the murder of his father by the Emperor Divoun of Almayne, his mother sold him to heathen merchants as a slave. Thus he journeyed to Ermony (Armenia), where he won the affection of the King, Ermyon, and the love of his beautiful daughter, Josian. The conquest of Brademond of Damascus, the slaying of a ferocious boar, and of a dragon, and the overthrow of a giant named Ascapart, whose life he spared, are among his achievements. He possessed a celebrated sword called Morglay. His death after 30 years of domestic felicity took place at the same time as that of his wife and his horse, Arundel. The story was retold by Michael Drayton in *Polyolbion*, 1622. Dr Kölbinger ed. the romance for the Early Eng. Text Society in 1886.

Bewcastle, vil. of Cumberland, England, 11 m. from Brampton, with a famous late 7th-cent. Anglian cross carved with a runic inscription. The church is 11th cent. Pop. 540.

Bewdley, bor. of Worcs, England, on the Severn, 14 m. NNW. of Worcester. It has manufs. of leather, combs, brass and iron ware, malt, bricks, and rope. The tn is an ant. one, and its prosperity dates from the 15th cent. Pop. 5000. See also BALDWIN OF BEWDLEY, EARL.

Bewick, Thomas (1753-1828), wood-engraver, was the son of the lessee of a small colliery. Showing small aptitude

for learning, but decided talent for art, he was apprenticed, in 1767, to Ralph Beilby, a Newcastle engraver, with whom he afterwards entered into partnership. Having pub. many woodcuts in his *Select Fables*, 1784, he estab. his reputation as an artist and engraver by the vignettes and tail-pieces of his *History of Quadrupeds*, 1790. His observation, virile humour, and technical mastery are most conspicuous in his *History of British Birds*, 1797-1804. See monograph by M. Weekley, 1953.

Bewsher, Samuel (1852-1915), school-master, and once bursar at St Paul's School. He was the founder (1881) of the preparatory school of Colet Court which prepares boys for St Paul's School.

Bex, vil. of Switzerland, in the Rhône Valley, canton of Vaud, about 30 m. SE. of Lausanne, with which it is connected by rail. There are salt mines and sulphur springs. Pop. 5000.

Bexhill-on-Sea, residential and holiday resort on the coast of Sussex, England, 62 m. from London and 5 m. from Hastings. B. is mentioned in Domesday Book; the church of St Peter in the old tn dates back to 1070, and houses the B. Slab, a Saxon tomb slab. Here is the De La Warr Pavilion (1937), a well-known example of contemporary architecture. Pop. 25,700.

Bexley, Nicholas Vansittart, 1st Baron (1766-1851), politician, b. in London, son of Henry Vansittart, governor of Bengal, and educ. at Christ Church, Oxford. He became M.P. for Hastings in 1796, and sat for various constituencies, without a break, for 25 years, until he was raised to the peerage. He was joint secretary to the Treasury in 1801, and again, under Sidmouth, in 1806, and estab. a reputation as a financial expert which has not stood up to subsequent examination. After Waterloo when a reduction of taxation was generally anticipated, he declined to abolish the property or income tax and instituted further complicated schemes for effecting economies in the National Debt services. He was now highly unpopular and, eventually, in 1822, resigned.

Bexley, residential bor. of NW. Kent, England, 11 m. SE. of London. Pop. 89,000.

Bev, see BEO.

Bevers, Christian Frederik (1869-1914), S. African soldier, b. Cape Colony, practised as lawyer at Witwatersrand. On Boer side in the war, 1899-1902, he became a general. Under Brit. rule, he was Speaker of Transvaal House of Assembly, 1906. Commandant-General of Defence Force of S. Africa, 1910; visited England, 1912. At the outbreak of First World War, he resigned, and joined in Maritz's rebellion. Caught trying to cross Vaal at Greyling, 7 Dec. 1914, he was shot at and fell into the riv., where he was drowned.

Beyle, Marie Henri (1783-1842), Fr. author, known by his pen-name of Stendhal, b. Grenoble. He was in turn soldier, shopman, and diplomatist. After some years spent in the commissariat, he accompanied Napoleon on the Russian

campaign, and was present during the retreat from Moscow. After the fall of Napoleon, he took up his residence in Milan. In 1821 he was compelled to leave this city, and returned to Paris, where he soon became known in literary circles. In 1830 he was appointed consul at Trieste and then at Civita Vecchia, and in this post he continued till his death. His works are numerous, chiefly falling into the divs. of critical works and novels, and they are all remarkable for fineness of observation and for the extraordinary abundance of their ideas. Of the first div. are *Histoire de la peinture en Italie*, 1817, *Rome, Naples, et Florence*, 1817, *Racine et Shakespeare*, 1823, 1825, and *Promenades dans Rome*, 1829. His chief novels are *Armance*, 1827, *Le Rouge et le Noir*, 1831, and *La Chartreuse de Parme*, 1839. Amongst a variety of miscellaneous works the following are interesting: *Essai sur l'amour*, 1822, and *Mémoires d'un touriste*, 1838. *Correspondance*, 1855, *Journal de Stendhal*, 1888, *Vie de Henri Brulard*, 1890, *Souvenirs d'égotisme*, 1892, and *Lettres à sa sœur*, 1892, all pub. posthumously, are valuable as autobiography. He had the gift of psychological analysis, and it is for this, rather than for continuity and arrangement of plot, that his novels are so outstanding. Although he shared many of the literary ideas of the romantics, he remained fiercely independent. His masterpiece, *Le Rouge et le Noir*, had an enormous influence on European literature, and with Julien Sorel he created a new type of hero. B.'s stock has risen appreciably in recent times, and it has been justly said that he was a century before his true era. See F. C. Green, *Stendhal*, 1939; L. Blum, *Stendhal et le Béhème*, 1941; A. Caracciolo, *Stendhal, L'Homme et l'œuvre*, 1951.

Beylerbey, see BEGLERBEY.

Beyrich, Heinrich Ernst (1815-96), Ger. geologist and palaeontologist, b. Berlin. In 1836 he became prof. of geology and palaeontology at Berlin Univ., and in 1873 director of the geological dept.

Beyschlag, Willibald (1823-1900), Ger. Protestant theologian and writer, b. Frankfurt-on-Main. His works include *Die Christologie des Neuen Testaments*, 1866, *Leben Jesu* (2 vols.), 1855 (3rd ed.) 1893, *Neutestamentliche Theologie* (2 vols.), 1891-2, *Christenlehre auf Grund des kleinen lutheranischen Catechismus*, 1900, and *Aus meinem Leben*, 1896-8.

Beza, or de Béze, Theodore (1519-1605), Fr. theologian, b. Vézelay in Burgundy; studied at Orléans, under Melchior Volmar, who taught him Greek and inspired him with his first leanings towards Protestantism. He studied law, but gave himself largely to polite society and literature, and wrote *Poemata juvenilia*, a vol. of loose verse, 1548, which later he regretted. In 1548 a severe illness brought about his conversion. He had already decided not to become a Catholic priest, and now, after marrying his mistress, Claudine Denosse, he joined Calvin (q.v.) at Geneva, and became prof. of Greek at Lausanne. In

1550 he pub. a drama on *The Sacrifice of Abraham*, and began a series of lectures on parts of the N.T., which ultimately led him to trans. all of it into Latin. In 1559 he became prof. of theology at Geneva with Calvin. In 1561 he represented the Protestants at the Conference of Poissy, returning to Geneva in 1563. Next year Calvin d., and B. took his place as head of the reformed churches of France and Geneva. In 1571 he presided over the synod of La Rochelle. His best-known works are an ed. of the Gk Testament, *De Haereticis a civili magistratu puniendis*, and the doubtful *Histoire ecclésiastique des églises réformées du royaume de France*; his *Confessio and Tractationes Theologicae* are still of value to theologians. B.'s Codex, the Codex Bezae, or Codex D, is a Gk MS. of the N.T. in uncial characters, dating from about the 6th cent. B. presented it to the univ. of Cambridge in 1581, with a rather untrustworthy account of its hist. See lives by Heppe, 1861, Baird, 1899.

Bezant, or Byzantine, name of a coin of the Byzantine empire. The value of the gold B. varied from 10s. to a sovereign, that of the silver B. from 1s. to 2s. The gold B. was for cents, the chief gold coin of the world and was widely imitated. Owing to the commercial relations which the Byzantine empire then had they were distributed throughout the known world. They were in use in England and India until the reign of Edward III. The fact of their being brought home by crusaders led to their use in Eng. heraldry.

Bezant (heraldry), see ROUNDELS.

Bezhitza (1935-43 Ordzhonikidzgrad), former tn in the Bryansk Oblast of Russia, the main centre of heavy industry in the Bryansk industrial area. Pop. (1956) 74,000 (1939, 82,000). It was fused with Bryansk (q.v.) in 1956.

Béziers (Rom. Julia Septimana Biterrea), Fr. tn, cap. of an arron., in the dept of Hérault. It is on the edge of a plateau overlooking the R. Orb. There are pre-Rom. and Rom. remains. In 1209 there was a massacre of the townspeople by Simon IV de Montfort (see under MONTFORT) during the crusade against the Albigenses (q.v.). In the 16th and 17th cents. the tn was a Huguenot (q.v.) centre. There is a fine Gothic church, formerly a cathedral, and many anct buildings. Textiles, chemicals, and confectionery are manuf., and the tn is a commercial centre for wines and spirits. Pop. 64,950.

Bézique (corruption of Fr. *bésigue*, origin uncertain), game at cards which, under varying rules, may be played by 2, 3, or 4 persons, the number of packs being the same as the number of players, usually played by 2 players. The piquet pack of 32 cards is used, but in duplicate, the 2 packs being shuffled together. The dealer then deals 8 cards to each player, dealing 3, 2, 3, and the cards that remain are laid on the table between the players, forming the 'stock.' Trumps are fixed either by turning up the top card of the stock or by the suit of the first marriage

or sequence (*see* below) which occurs during the game. The non-dealer then plays the first card, and the second player is not compelled either to win the trick (which he can do by trumping or by playing a higher card of the same suit) or to follow suit. Unless he has something to declare, he will probably avoid winning the trick. After each trick, each player takes a card from the stock and places it in his hand, the winner taking the top card. This continues until only 2 cards remain in the stock. The trick that follows is called the 'last trick,' and after the stock is exhausted the last 8 tricks are played under different rules. The aim in B. is not to gain tricks. It is (1) to secure certain combinations of cards in the hand, which, when declared, add to the score; (2) to gain in play brisques, i.e. as many aces and tens as possible; (3) to win the 'last trick,' which, as explained above, is not the last trick of the game. Scores are gained as follows: *Marriage* (king and queen of any suit), 20; *Royal Marriage* (king and queen of trumps), 40; *Sequence* (ace, ten, king, queen, and knave of trumps), 250; *B.* (queen of spades and knave of diamonds), 40; *Double B.* (all the B. cards), 500; four aces (of any suit, whether duplicates or not), 100; four kings, 80; four queens, 60; four knaves, 40. These are all gained by declaration. Winning of last trick, 10. In addition to this, if the dealer turns up the seven when turning up for trumps, he counts 10. If the seven of trumps is in the hand, the player may either exchange it for the card turned up, or declare it and count 10. Lastly, at the end of play, each player counts up the number of aces and tens in the tricks he has won, and registers 10 for each.

The deal goes on alternately until one of the players has scored 1000. This closes the game. If the loser has scored less than 500 points, the game counts double. Three and four-handed B. are played under almost the same rule. In four-handed B. the players may form partners, declarations may be made after a win by either partner, and B.s may be from either hand. Other forms of the game are Polish (or open) and Rubicon B.

Bezoar, or **Bezoar Stone**, concretion or hardened mass occasionally found in the stomach or intestines of ruminating animals, as goats, llamas, antelopes, cows, etc. The name is of Persian origin, and means antidote to poison, the stones obtained from the Persian wild goats being at one time much esteemed in that connection. They appear to be formed through the presence of some irritating substance in the alimentary tract. Balls of hair are found in the intestines of Brit. cattle, but these have little or no accretion. The term is sometimes applied to the fossilised dung of extinct animals found in the Lias beds of Glos. *See* CAPRA.

Bezawada, now called Vijayawada, tn in Andhra State, India. Situated on the l. b. of the R. Krishna (Kistna) B. has long been an important centre of communications by land and by canal and was once an important Buddhist religious

centre. In the local museum there is a colossal figure of Buddha in black granite found in one of the striking hills which hem the town in. There is also a fine Hindu cave-temple of great antiquity at Undavalli close by.

Bhagavad-Gītā (the song of the blessed), religious and philosophical poem of India which is inserted as an episode in the 6th book of the *Mahābhārata*. It begins by describing the state of war between the 2 tribes of the Pāndus and the Kuras. The 2 tribes are closely united in blood, and this renders Arjuna, Chief of the Pāndus, unwilling to slaughter his adversaries. But Krishna is with him in the form of his charioteer, and now recalls him to his duty, and instructs him in the work of a warrior. As the instruction continues it becomes more elevated and mystical, until at last Krishna reveals himself as the supreme lord of creation. The work is the greatest ethical product of Indian philosophy, but there is much confusion of elements caused by the various alterations it has undergone. Pantheistic and monotheistic ideas are mingled with high ethical teaching. The main aim of the book is to teach the way of mystic souls to the Yoga or absorption in the Deity, which it proposes as the highest aim of humanity. The later recension of the work shows traces of the influence of Buddhist and possibly even of Christian thought. *The Song Celestial* is a trans. or paraphrase of the B.-G. done into blank verse by Sir Edwin Arnold. *See* N. Macnicol (ed.), *Hindu Scriptures* (Everyman's Library), and S. Radhakrishnan, *The Bhagavad-Gītā*, 1948.

Bhagirathi: 1. One of the chief head-streams of the Ganges, rising on the W. slopes of the Himalayas in the neighbourhood of Kedarnath (22,770 ft.). It is regarded as sacred by the Hindus.

2. Branch of the Ganges which flows past Murshidabad, and later becomes the Hugli, one of its prin. outlets.

Bhamo, tn of Burma, on Upper Irrawadi, 40 m. W. of the Chinese frontier. B., the second largest tn in the Kachin state, has been a trading centre on the trade route to Yunnan, in China, since the 12th cent. An Anglo-Chinese convention in 1893 gave special trading rights with Yunnan to Britain. Its chief industry is the transit of goods. During the military operations in Burma in 1944, B. fell to Chinese forces on 16 Dec. Pop. 10,000.

Bhandarkar, Sir Ramkrishna (1837-1925), Indian orientalist, son of a Brahman civil servant. Was recognised as one of India's most distinguished orientalists, and represented the Bombay Presidency at the Vienna Congress of orientalists. He was the founder of the *Indian Antiquary* (1872); pub. *The Early History of the Deccan*, in 1884.

Bhang (Hindu word), name for Indian hemp (*Cannabis sativa*), but applied to a narcotic drug formed from its dried leaves. It is used sometimes for smoking, either alone or with tobacco, sometimes it is strained in water to produce an intoxicating drink, sometimes it is used for

chewing. It is in common use among the Indian races, and also among the Arabians and Egyptians. In addition to intoxicating effects, it produces hallucinations, as opium does.

Bharata Natyam, classical dance art of India, originating in the dances of the deva-dasis, the temple dancing-girls. Though the practice of dedicating girls to this service has been abolished, the art has been preserved, in its most pure form in S. India, and is studied by amateurs and professionals. Its development envisaged performance by women dancers alone. It can take the form of pure dance with the accent on the rhythmic element or of expressionistic dance, illustrating a story with the help of mime and of *mudras* or symbolic gestures. Since temple companies have ceased to exist, dances for *ensembles* are not often performed.

Bharatpur, former Indian State now included in Rajasthan state, India. The cap. of the state is the tn of B., whose immense mud walls still remain. It successfully resisted a siege by the British in 1804, but was captured by them in 1826. See INDIAN PRINCELY STATES.

Bhartihari, Indian poet who is supposed to have lived during the 1st cent. BC, but sometimes identified with a writer who lived c. 650 AD. The best-known work attributed to him is a collection of apophthegms, arranged in 3 centuries or groups of 100. It is possible that they are the work of various hands. The first century deals with love, the second with ethics and morality, the third with asceticism, and devotion to the Divine Being. A critical ed. by Böhlen appeared at Berlin in 1833.

Bhatkal, tn in the S. of Bombay, India, 80 m. N. by W. of Mangalore. Was a prosperous mart from 1300 to 1600 when it was the port for Vijayanagar (q.v.).

Bhattacharya, see KUMARILA BHATTĀ.

Bhau Daji, or Ramkrishna Vital (1822-1874), Indian physician, a Sarasvat Gond Brahmin, b. Mandra, Goa; educ. in Bombay, and became a teacher in the Elphinstone School; studied medicine at the Grant Medical College, 1845-50. He did valuable research work in connection with the treatment of leprosy.

Bhavabhuti, Indian dramatic poet who fl. at the beginning of the 8th cent. of our era. He came of an illustrious Brahman family, and is the author of 3 Sanskrit dramas which raise him to the level of Kālidāsa and Harsha. The 3 are the *Mahāvīra-charita*, *Uttara-rāma-charita*, and *Mūlātī-Mādhava*, the story of the two first being drawn from the legend of Rama. All three have been trans. into English separately.

Bhavnagar, or Bhavnagar, formerly a princely state of India, then merged in Saurashtra state, now itself merged into Bombay. The cap. is a port on the Gulf of Cambay, 60 m. NW. of Surat, and is an important centre for the export of Kathiawar cotton. See INDIAN PRINCELY STATES.

Bhils, aboriginal, pre-Aryan people of Central India, found scattered over the hilly dists. there, but especially in the Khandesh dist. of Bombay and the Vindhya Hills. They were driven out of the fertile dists. by the Aryan invaders, and thenceforth led the wild, nomadic life of outlaws. An unsuccessful attempt having been made to subdue them, the Bhil Corps was formed in 1825 to utilise their fighting instinct, and this corps secured some order in their dists. The Bhil is short dark, active, and a great woodman; he is brave but superstitious. They number about a million.

Bhilai, tn of Rajasthan, India, on the Betwa R., 26 m. NE. of Bhopal (q.v.), and 16 m. NW. of the famous Sanchi (q.v.). B. itself is a place of Hindu pilgrimage, and has taken the place of a very ancient Hindu city, Vidisa.

Bhopal: 1. Former Indian princely state (q.v.), since 1956 merged into Madhya Pradesh state. It was founded in 1723 by Dost Mohamed Khan and concluded a treaty with Britain in 1818.

2. The former cap. of B. state, now the cap. of Madhya Pradesh, 325 m. SW. of Allahabad. It has an aerodrome and is watered by 2 large artificial lakes. The Taj-ul-Masjid is said to be the largest mosque in India. Pop. 102,000.

Bhowanagore, Sir Manoharjee Merwanjee (1851-1933), b. Bombay, the son of a Parsee merchant; educ. at Elphinstone College and Bombay Univ.; became sub-editor of the *Statesman* in 1871. In 1873 he came to England as state agent for the maharaja of Bhavnagar. In 1895 he entered Parliament as Conservative member for Bothnal Green. He was knighted in 1897. He pub. *History of the Constitution of the East India Company*, 1871, and a Gujarati trans. of Queen Victoria's *Life in the Highlands and Loyalty of India*, 1916.

Bhubaneswar, city of Orissa state, India (see BHUVANESHWAR).

Bhutan, independent state in the E. Himalayas, bounded on the N. and E. by Tibet and India, on the S. by India, on the W. by the independent state of Sikkim. The surface is extremely varied, and B. presents a series of lofty, forest-clad mt ranges, alternating with deep-out valleys. Through these valleys swift rivers run in a southerly direction, ultimately joining the Brahmaputra. During Brit. rule in India relations with B. were governed by various treaties from 1774 onwards, the substance of all of which was to guarantee B.'s internal independence, to provide that external relations should be subject to Brit. guidance, and to fix an ann. subsidy. In 1942 this was fixed at Rs. 200,000. In Aug. 1949 the Indian Gov. negotiated a similar treaty, with a subsidy of Rs. 500,000. The maharajah has an agent at Kalimpong (India); the Gov. of India are represented in B. by the political officer, Sikkim. There were formerly 3 supreme chiefs of the state, the Dharma Raja, head in spiritual matters, and the Deb Raja, head in temporal affairs; but in 1907 the

governor of E. B. was elected hereditary maharajah by the Buddhist ecclesiastics and people. His grandson became maharajah in 1952. The religion is Buddhism. The area of the state is estimated at 18,000 sq. m., and the pop. at 600,000. Chief tns are Tashi-Cho-Dzong and Punakha (the cap.). The huge feudal castles of B. and the Buddhist temples in inaccessible situations, such as Tak Thsang, the Tiger's Nest, are described by the Earl of Ronaldshay in *Lands of the Thunderbolt*, 1923.

Bhuvaneshwar, cap. of the Indian state of Orissa, 30 m. N. of Puri. B. is a very ant. city, the earliest record of which dates back to about AD 500. It once had reputedly 7000 temples and was a great centre of pilgrimage, though it had little modern importance when chosen for the site of a new cap. lately. It still has 500-600 temples; the Great Temple is said to be one of the finest purely Hindu temples in India. Near B. are the wonderful carved cave temples (Buddhist and Jain) of Udayagiri and Khandagiri. Since 1948 B. is being developed as a model administrative centre.

Blafa, see **BIELSKO**.

Blafra, Bight of, bay on the W. coast of Africa, on that part of the Gulf of Guinea lying between Cape Formosa on the N. and Cape Lopez on the S. It contains the is. of Fernando Po (Sp.), Prince's and St Thomas (both Portuguese). Into it flow various important rvs., the Niger, New Calabar, Old Calabar, Rio del Rey, Camerooun, and Gaboon.

Bialik, Chaim Nachman (1873-1934), Heb. poet, b. in the Ukraine. Opposed the Bolshevik regime, mainly because of its suppression of the Heb. language, and went to Palestine where he became a national hero. He is indeed looked upon as the best modern Heb. poet and numerous streets in Jerusalem and other Zionist cities are named after him. He d. in Vienna.

Bialogard (Ger. Belgard), tn of Poland, in Kozalin prov., on the R. Prosnica, 15 m. SW. of Kozalin (q.v.). It has a Gothic church and an ant. castle, and is in a dist. producing live-stock, sugar-beet, and fruit. Pop. 15,000.

Bialystok (Russian Byelostok, Belostok: 1. Prov. (województwo) of NE. Poland, bordered on the N. and E. by Russia. The greater part of its ter. was annexed to Belorussian S.S.R. (see **BELO-RUSSIA**) 1940-5. The prov. is low-lying, is mainly agric., and is watered by the Bug (q.v.) and the Narew. Area 8696 sq. m.; pop. 918,000.

2. City of Poland, cap. of B. prov., 107 m. NE. of Warsaw (q.v.). It was founded in the 14th cent., and belonged to Prussia from 1795 until ceded to Russia by the treaty of Tilsit (q.v.) in 1807. During the First World War B. was the scene of one of the final battles in the Ger. campaign against the Russians in 1915; at the end of the war it went to Poland. During the Second World War the Germans made a thrust towards the B.-Brest-Litovsk railway during the invasion of Russia in 1941, and there were

fierce battles in the B. area (see **EASTERN FRONT IN SECOND WORLD WAR**). By the end of the war a large part of the tn had been destroyed, but reconstruction started almost immediately. There is an important textile industry, and metallurgical, chemical, and engineering manufs. Pop. 66,000.

Blancavilla, tn in Sicily (q.v.), on the SW. slope of Mt. Etna (q.v.), 16 m. NW. of Catania (q.v.). It has a trade in citrus fruits, wine, and grain. Pop. 21,000.

Blanchina, Francesco (1662-1729), It. astronomer, b. Verona. He was a favourite of Pope Alexander VIII, whose librarian he had been, and continued in favour under Clement XI, who made him secretary of the committee for the reformation of the calendar. In 1726 he made observations of a bright spot on Venus and concluded that its period of rotation was 24 days 8 hrs. There is no consensus even now on this period.

Blandrata, Giorgio, see **BLANDRATA**.

Blard, Auguste François (1798-1882), Fr. genre painter, b. Lyons. He visited the Levant, Greenland, and Brazil. Some of his pictures show the influence of these varied travels, but he is mainly remembered as one of the few Fr. painters of humorous anecdote.

Blarritz, Fr. watering-place in the dept. of Basses-Pyrénées, on the Bay of Biscay. Under the patronage of the Empress Eugénie (q.v.) B. rose from a small fishing vil. to a fashionable resort. It has a mild climate, splendid beaches, casinos, and luxurious villas and hotels. Pop. 22,000.

Bias (c. 550 BC), son of Tentames, b. at Priene, in Ionia, was one of the Seven Sages of Greece. He became a distinguished citizen of his native tn, and many of his apophthegms have been preserved. The stories associated with his name, such as his persuasion of the Ionians to settle in Sardinia, are probably unauthentic.

Bib, Whiting-pout, or Brassy, popular names of *Gadus luscus*, a fish belonging to the family Gadidae and of the same genus as the cod, whiting, and haddock. It is about a foot long and less than 5 lb. in weight. It occurs in the N. Sea and Arctic Ocean.

Biban-el-Muluk, valley of Upper Egypt, on l. b. opposite Thebes, in which are the tombs of the kings of the 18th, 19th, and 20th dynasties.

Bibbiena, Bernardo Dovizi da (1470-1520), It. cardinal, was the son of poor parents. Having entered the service of Cardinal Giovanni de' Medici, he followed him to Rome after the death of Alexander VI and was there entrusted by Pope Julius II with sev. important commissions. When his patron became pope in his turn as Leo X, he presented B. with his cardinal's hat in the year 1513. He had a lively interest in the progress of literature, and himself wrote plays in the manner of Terence. His best play, *La Calandria*, was performed in Urbino in 1513.

Bibbiena, It. tn, in Tuscany (q.v.), 17

m. N. of Arezzo (q.v.). The church has 2 terra-cottas by Luca della Robbia. Pop. 9000.

Bibby Line Ltd., steamship line founded by John Bibby in 1807. It has traded with the Far E. for a cent. and a half. The fleet now consists of 6 motor vessels (Diesel), and 3 steamers built on the Clyde by Fairfield. The 6 liners carry cargo, mail, and first-class passengers and run principally to Ceylon and Burma. In addition the company has 2 troopships of 10,000 tons and 1 of 20,000 tons. The line is operated by the firm of Bibby Brothers & Co., Bankers and Ship-owners of Liverpool.

Biberach, Ger. tn in the Land of Baden-Württemberg (q.v.), on the Riss, 53 m. SE. of Stuttgart (q.v.). It is a former free city of the empire. The Austrians were defeated here in 1796 by Gen. Moreau (q.v.), and in 1800 by St. Cyr. It has medieval towers and gates, fine old mansions, and a splendid 13th-18th-cent. church, as well as a museum and an art gallery. There are mineral springs. Pop. 17,000.

Bibliena, family of It. architects (17th and 18th cents.); notable designers of theatres and theatrical scenery in Italy, France, Austria, and the small princely court towns of Germany. The prin. members of the family were Francesco B. (1659-1739), who built theatres at Verona and Nancy, and his nephews—Antonio B. (1700-74), who built theatres at Rome, Bologna, Siena, Mantua, Pistoia, Livorno, and Giuseppe Galli B. (1696-1756), who pub. many magnificent engravings of theatrical designs.

Bibiru, see GREENHEART.

Bible, The (Gk *ta biblia*, 'the books'; Lat. *Biblia* (singular); in N.T. referred to as *hai graphai*, 'the writings, scriptures'). The B. contains in 1 vol. the sacred books of the anc. Israelites and of Christianity. It falls into 2 parts, the Old Testament (O.T.) and the New Testament (N.T.), testament really meaning covenant. The relations of the Israelites with God were governed by a covenant, ratified with Moses on Mt. Sinai (see ISRAEL). This made them a Church, the Elect or Chosen People of God. Jesus Christ (fulfilling prophecy, cf. Jer. xxxi. 31ff.) replaced the old Mosaic covenant with a New Covenant in His blood, at the Last Supper and on the Cross. This covenant, rejected by all but a small remnant of the Jews, was not racial or national, like the Old, but universal (Catholic), and open to all mankind, and under it was estab. the Christian Church as God's new Israel, inheriting all the promises of the Old. The Hebrew for covenant, trans. into Greek by the ambiguous *diathēkē*, became the misleading Latin *Testamentum*. The O.T. and the N.T. are the record of God's revelation of Himself to mankind, under the 2 dispensations, of the Old Covenant and the New.

(a) *Its historical value*. For Jews and Christians the truth of their B. is in a special sense guaranteed by its divine inspiration (see (b) below). Its immense religious importance, however, with the

growth of rationalism since the Reformation and the development of scientific historical method and research, has led to a minute and sceptical scrutiny and testing of its trustworthiness and authenticity since the 18th cent., an ordeal from which the Scriptures have now emerged with their value as first-class and reliable historical documents triumphantly vindicated. As a mere record of antiquity, intimate and continuous over an immense period of time, and covering almost every field of human life, the B. is of unique historical importance. At times the most damaging theories were put forward concerning the authorship, the date, and the trustworthiness of the biblical documents (e.g. by the 19th-cent. Tübingen school of criticism, q.v.). But always with the growth of knowledge, and the great advances made by archaeology and philology, sceptical theories have been refuted, and the B. justified. 'In the light of such evidence, it is a far cry from the time when adventurous European savants could seriously date the composition of a considerable part of the Heb. B. in early Rom. times...' and suggest 'equal absurdities in dating parts of the N.T. ... It is sheer hypercriticism to deny the substantially Mosaic character of the Pentateuchal tradition. Abraham, Isaac, and Jacob no longer seem isolated figures, much less reflections of later Israelite hist. ... the patriarchal narratives have a historical nucleus throughout,' recast in a way 'emphasising its religious and pedagogical values. Our gain is thus far greater than any possible loss [by omission of details]. There is no longer the slightest reason for dating the song of Miriam (Exod. xv) after the 14th cent. B.C.' (W. F. Albright, *The Archaeology of Palestine*). The same scholar, describing the historical books that follow the Pentateuch, speaks of them as compilations of 'priceless documents copied or abridged with the greatest care, and some ... reproduced verbatim,' and of 'painstaking care and accurate reproduction of the compiler's material,' including 'older written documents and oral tradition.' As for the poetic books of the O.T., he says 'archaeology tends to modify ... extreme positions' as to their dating. 'There is no longer any reason to refuse a Davidic date for such psalms ... it has become improbable that any of them descend below the 4th cent. B.C. We find a similar position with Proverbs ... (and) there is now less reason than ever to date Job and Ecclesiastes after the 6th, 5th, and the 3rd cents. respectively ... The facts brought to light by Palestinian archaeology agree with specific points in biblical hist. ... Biblical historical data are accurate to an extent far surpassing the ideas of any modern critical students, who have consistently tended to err on the side of hypercriticism' (op. cit.).

As Prof. Albright says, it is far more difficult to apply archaeology to the N.T. than to the O.T.: the latter spans a period of over a millennium and a half,

whereas the N.T., from the opening of Christ's public ministry to the death of Sts Peter and Paul, covers only about a third of a cent. Yet wherever historical research and discovery have shed any light it has always confirmed in an astonishing way the truth and meticulous accuracy of the N.T. writers. This is particularly so with St Luke, in his Gospel and in Acts. (Cf. E. Power, 'Archaeology and the Bible,' in *Catholic Commentary on Holy Scripture*, 1953; W. F. Albright, Director, Amer. School of Oriental Research, Jerusalem, 1919-36, *op. cit.*; F. G. Kenyon, *The Reading of the Bible*; and all modern commentaries on Luke.)

This scrupulous historical truthfulness on the part of the biblical authors is a natural consequence of their religious faith, quite apart from any question of divine inspiration. They worshipped the God of Truth, and also the Living God, a God manifesting Himself actively in hist. Judaism and Christianity are unique in being specifically historical religions: their teachings are bound up inextricably with the truth of a certain series of historical events as such. Their scriptures therefore consist very largely, not of myths and legends, but of historical records, and unless these are true the religion itself loses its credentials.

(b) *Inspiration*. Jews (see JUDAISM) and Christians alike regard their scriptures as the inspired Word of God. But since the Reformation Christians have been divided as to what inspiration implies. All agree that the human authors were inspired by the Holy Spirit, and that the B. is both a record of God's self-revelation to His people and also, in a real sense, God's Word, speaking to us to-day. But widely varying views are held about (i) the doctrinal sufficiency of scripture, and (ii) the nature and extent of inspiration, especially with reference to the inerrancy of scripture. (i) It was a cardinal tenet of the Protestant reformers, in rejecting eccles. authority, that the B. and the B. only, was the source of Christian doctrine, and that its meaning is evident enough to any man who reads it with the help of the Holy Spirit. Previously, however, it had been universally accepted that there were 2 founts of revealed truth, the B. and the tradition of the Church, and the former was to be interpreted in the light of the latter. Christianity for over a cent. had no N.T. The apostolic B. was the O.T. only, and Christ gave His Apostles authority to teach all nations, which they did, explaining the O.T. in accordance with their oral Gospel. The N.T. is the written deposit of that primitive oral teaching; but does it contain it all, and without ambiguity? And when the N.T. was finally completed and assembled, did the oral tradition of the Church lose its authority? Protestants said yes; Catholics said no. The Council of Trent (Session IV) affirmed that revelation 'is contained in written books and in traditions without writing, traditions which were received from the

mouth of Christ Himself, and from the Apostles under dictation of the Holy Spirit, and have come down to us, delivered, as it were, from hand to hand.' The Church of England, taking a middle course, accepted both scriptures and eccles. tradition, but declared that the function of the latter is only to explain the former ('the Church to teach, the B. to prove') and that 'Holy Scripture containeth all things necessary to salvation, so that whatsoever is not read therein, nor may be proved thereby, is not to be required of any man that it should be believed as an article of the Faith or be thought requisite or necessary to salvation' (Article vi). (ii) Until a cent. or two ago Christians had from the earliest times believed the B. to be verbally inspired: God was its primary author and dictated to the human writer the words he wrote, so that, since God cannot lie, be deceived, or be ignorant of any matter, the Scriptures were utterly free from error of any kind. So Augustine, writing to Jerome (c. 406): 'I have been taught to view the canonical Scriptures (and only them) with such reverence and respect as will show my unshakable belief that none of their authors has made any error in his writings.' But with the rise of sceptical rationalism, and the great development of natural and historical science, the old belief in the verbal inspiration and inerrancy of the B. was badly shaken. Outside the Rom. Catholic Church, roughly speaking three types of opinion now prevail. The extreme Protestant *Fundamentalists* (q.v.) cling to an absolute belief in the verbal inspiration and inerrancy of the B. and, in some cases, even of the A.V. They reject any finding of science or hist. that conflicts with a biblical statement, refusing to concede to modern science and the critical scholar an authority over God's Word that they have denied to the Church. Their obscurantism often leads them to quote biblical texts piecemeal, without reference to their context or the modifying light cast on them by the B. as a whole. At the other extreme the *Modernists* regard biblical inspiration as differing in degree, perhaps, but not in kind, from ordinary artistic and literary inspiration, and conferring no guarantee of truth or inerrancy whatever. The B. for them is the record of man's evolving faith, as God has led him nearer and nearer to the truth. There are practically no facts stated in the B. that they are not ready to jettison or explain away, allowing them perhaps a symbolic or pedagogic value. Miracles never happened. Christ was only a supreme prophet. The Gospel is reduced to morality, and even that has to be modified to suit modern needs, conditions, and knowledge. Between, are the *Conservatives*, believing the B. to be inspired in a unique sense, but not verbally nor in a way that conferred inerrancy except within the field of theology, though even there the B. has to be viewed as a whole, and the help of science and sound scholarship is needed for its interpretation. They are inclined

also to regard inspiration as a fluctuating influence, so that some parts of scripture may be viewed as more inspired than others. *The Rom. Catholic Church*, on the other hand, maintains strictly the plenary inspiration and inerrancy of scripture in every part alike, but welcomes all the certain findings of science and historical research. Leo XIII taught that the Holy Spirit roused the human author to write, and so assisted him in the work of composition that those things only and wholly which He wished should be written down; furthermore he declared that divine inspiration not only excluded all error, but did so of absolute necessity, inasmuch as God, the absolute Truth, cannot be the author of any error whatsoever (*Providentissimus Deus*). How then account for the contradictions and discrepancies that have been found in the B., and apparent contradictions between science and scripture? In the first place, inspiration and inerrancy belong to the original MS., as it left the author's hand, only. Copyists errors and alterations of the text have to be allowed for. Then, 'no error whatever exists where the sacred writer, treating of physical matters, followed sensible appearances, expressing himself metaphorically, or in the manner current at the time... the Holy Spirit did not intend to teach men these matters, which are in no way profitable to salvation' (*op. cit.*). And, more recently, Pius XII in his encyclical *Divino Afflante Spiritu* has declared that ancient documents must be interpreted strictly in accordance with the norms proper to the particular literary genres to which they belong, in which respects they differ very greatly from modern writings.

(c) (i) *The canon of scripture* (Gk *kānon*, a rod, or rule) is the list of those writings which conform to the rule of divine inspiration, and so form the B. *The O.T. canon* came to be recognised in 3 main stages, corresponding to its Jewish div. into 3 sections: the Law (Torah), the Prophets, and the Hagiographa (Sacred Writings). The Law consisted of the Pentateuch (see PENTATEUCH) or Five Books of Moses (cf. (a) above). It reached its final form about the time of Ezra or soon after (c. 400 BC). The B. of the Samaritans, whose breach with Jewry became irremediable from this time, contains the Pentateuch only. The other sections of the B., however, were already formed (or forming) and venerated at that time. The corpus of the *Prophetic Writings* had certainly acquired canonical status, alongside the Torah, and been closed by about 200 BC, as we can see by references to it in Ecclesiastics (written about 185 BC). It contains the Former Prophets, i.e. the historical books of Joshua, Judges, Samuel, and Kings, compiled by the early prophetic schools, and the Latter Prophets, i.e. the 3 Major Prophets (Isaiah, Jeremiah, and Ezekiel) and the 12 Minor Prophets (Hosea, Joel, Amos, Obadiah, Jonah, Micah, Nahum, Habakkuk, Zephaniah, Haggai, Zechariah, and

Malachi). The rest of the B., the *Hagiographa*, though it included much that was very ancient (e.g. Psalms and Proverbs), and though its accumulating contents were viewed as sacred and scriptural much earlier (being referred to as such in the prologue to Ecclesiastics which was written in 130 BC), did not reach its final definition for the Jews until the Christian era had well begun. The canon of the Jewish B. was defined and closed by the rabbis at the Synod of Jamnia, in AD 90-100, in their eagerness to preserve and protect what was left to them of their religious inheritance after the destruction of Jerusalem and the temple. This decision was ultimately accepted by Jewry, and it also had a disturbing effect on Christendom, though of course the Synod itself had no authority whatever in the Christian Church. In practice the Church had already given approval and recognition to the Gk version of the O.T., known as the Septuagint (LXX), which is the source of most of the quotations from the O.T. in the N.T. and in the early Fathers. The LXX, which had originated at Alexandria among the Jews of the Dispersion, contained a number of books and passages that were not part of the O.T. canon recognised by the rabbis at Jamnia. Some of these writings (e.g. Wisdom) had been composed in Greek at Alexandria. Nevertheless they were accepted by the Church as part of the inspired Scripture, though their absence from the recognised Heb. canon gave rise to some controversy later. Jerome, the great Hebraist, again and again rejected their canonicity (e.g. in the *Prologus Galeatus*), though in later writings he accepted them (cf. *Ap. contra Ruf.* II, 33). Even Gregory the Great described them as 'books which, though not canonical, are received for the edification of the Church' (*Lib. Mor.* 19, 21). The controversy continued throughout the Middle Ages, though the traditional acceptance of the disputed writings as part of scripture continued, and was endorsed at the Council of Florence, in the decree for the Jacobites. At the Reformation Protestants generally accepted the view of the Synod of Jamnia, and repudiated the disputed writings absolutely. The Church of England reverted to the view of Jerome and of Gregory, accepting them as part of the B. but to be 'read for example of life and instruction of manners, not... to establish any doctrine' (Article vi), and printing them as a separate section of the B. between the O.T. and the N.T., entitled *The Apocrypha*. For Rom. Catholics, however, the Council of Trent finally decided that the disputed writings, though Deuterocanonical, were as fully inspired a part of scripture as the other, or protocanonical, parts, and they are therefore printed among the latter in the order of the Latin Vulgate. (There is some confusion of terminology between Anglicans and Rom. Catholics. The Anglican 'Apocryphal' = the Rom. Catholic 'Deuterocanonical', and the Rom. Catholic 'Apocryphal' = the Anglican

'Pseudepigraphical.') The Anglican canonical Apocrypha still contains the books of Esdras and the Prayer of Manasseh, which Trent finally excluded from the inspired scriptures.

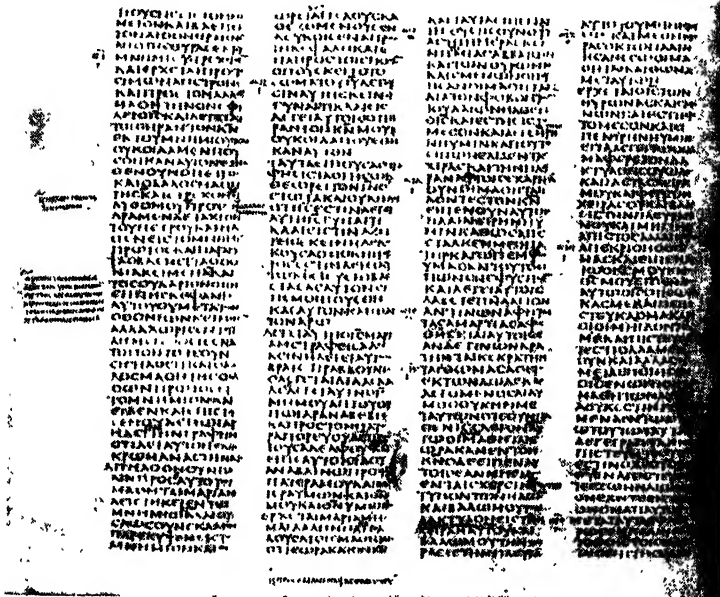
(ii) *The canon of the New Testament.* The N.T., like the O.T., took shape gradually. The Apostles did not set out to write a book but to teach by word of mouth, as they had been told. But as the Church spread preachers and catechists multiplied, and the need for written records of their teaching and witness was felt. This need intensified as the Apostles began to pass away from the scene. Written accounts of the life and teaching of Christ, at least in fragmentary form, were current quite early, as St Luke testifies in the prologue to his Gospel, and the canonical four were selected by the unerring judgment of the Church from a number of unsatisfactory if not completely spurious rivals. The essential criterion must have been immediate, or at least proximate, apostolic origin, a test that was later explicitly recognised to control the admission of any writing to the N.T. canon. This, however, was in the time of Tertullian and of Clement of Alexandria, the second half of the 2nd cent. Until then there had been perhaps some uncertainty in the matter owing to the existence of Christian prophecy, and to the claim of certain non-apostolic works to be authoritative as inspired by the Spirit, like the prophetic books of the O.T. The Christian dispensation, however, differs from the old, in that it begins with a revelation, in Christ, which is recognised as final and complete, so that the work and testimony of the Spirit in the Church and her writings is directed to the preservation and unfolding of that revelation as delivered to her by the Apostles. The O.T. on the contrary is a record of a growing incomplete revelation to which the prophets and other writers have an inspired contribution to make. The 4 canonical Gospels at any rate were recognised almost immediately as uniquely authoritative, and their dissemination throughout the Church was extraordinarily rapid. A papyrus fragment (P 52 Rylands 457, Manchester) of John xviii. 31-2, 37-8, discovered in Egypt and dating early in the 2nd cent., proves that the fourth Gospel (written in the last decade of the 1st cent.) was already circulating in Egypt within 20 or 30 years. Similarly a somewhat larger papyrus in the Brit. Museum contains the fragment of a life of Christ built out of quotations from all 4 canonical Gospels, dating again from early in the 2nd cent. Almost at once the four must have been treated as scripture among Christians, and equated with the O.T. In the 'Epistle of Barnabas' iv (c. AD 100), Matt. xxii. 14 is quoted with the biblical formula 'as it is written.' When we compare the N.T. Gospels with the kind of writing with which they had to compete (cf. M. R. James, *The Apocryphal New Testament*) we cannot but endorse the inspired wisdom of the Church in making her

choice. St Luke's 2nd vol., the Acts of the Apostles, naturally was received with the same veneration, from the first, as his Gospel. But in addition to these historical writings, a new form of inspired literature was being produced by the Apostles (and especially by St Paul) in the shape of letters to the churches and individuals whom they had established in Christ, and for whose welfare and problems they properly felt responsible. These letters were naturally treasured not only by their recipients, but by all the Christian communities who received copies of them (in some cases by direct apostolic command). That a collection of the Pauline Epistles was already being made and venerated as scripture in the earliest times is evidenced by the N.T. itself (2 Peter iii. 15); by Clement of Rome, in his Epistle to the Corinthians xiv. 1, in c. AD 96; by Ignatius in his Epistle to the Ephesians, xii. 1. in c. AD 117; and by Polycarp (c. AD 70-156) in his Epistle to the Philippians. The 2nd cent. saw the rapid completion of the local collections of copies of the N.T. writings throughout the Christian communities. Our evidence, which is indirect, and consists of the presence of quotations from the various books in documents of the period, shows that at first, here and there, this or that book had not yet been received, or at any rate not received with confidence as apostolic. The early Church was not credulous, and writings of the kind were scrutinised with caution. However, the N.T. books that were seriously disputed were few, and universal agreement about the contents of the Christian B. gradually crystallised. The process was hastened by the activities of the gnostic heretics, with their claim to possess a secret apostolic tradition of their own: of Marcion in particular (c. 150), who, to support his denial of the O.T. revelation, not only repudiated it but also expurgated Luke and rejected all but 10 of the Pauline epistles; and also of the Montanists, who claimed for Christian prophecy the power to add new revelations of the Spirit to the original apostolic deposit. So Christian lists, i.e. canons of the N.T., began to be drawn up, the earliest that is still extant being the Muratorian fragment, discovered by Muratori in the Ambrosian Library, Milan, in 1740. This canon dates from late 2nd-cent. Rome. It omits a number of canonical books, but its fragmentary nature makes it impossible to say for certain that it did not include them originally. From the beginning of the 3rd cent. the evidence (especially that of the Chester Beatty papyri) shows that the N.T. consisted essentially of its present books, though there were some that were still disputed in different parts of the Church. These Antilegomena, or Deuterocanonical elements of the N.T., are Hebrews, James, Jude, 2 Peter, 2 and 3 John, and Revelation. Of these, Hebrews and Revelation remained longest in doubt, Hebrews in the W. (chiefly because its Pauline authorship was contested, and perhaps too because it

might seem to assert that deliberate apostasy even under persecution was beyond repentance) and Revelation in the E., because it was quoted in support of the Millenarian heresy. The decree of Diocletian (303), directed specifically against the Christian Scriptures, shows that not only Christians but pagans were increasingly conscious of the unique importance of these books and probably helped to further their definition. Constantine had 50 copies of the complete

of its emphasis on the importance of works as indicative of faith. The Council of Trent (Session IV) in 1546 was the first council claiming oecumenical authority to deal with the canon, and it reaffirmed the N.T. in its traditional and complete form. See also under titles of the individual books.

(d) *Texts and versions.* The earliest extant MS. of the Heb. B. (apart from fragments) dates from AD 1010. The sanctity of the rolls caused the Jews to



PORTION OF CODEX SINAITICUS

British Museum

Christian B. made for his churches in Constantinople, under the direction of Eusebius (Eus. *Vit. Const.* iv. 36), which provided a standard for the E., and Eusebius recognised the N.T. as we have it, though he still expressed some hesitation over Revelation. The authority of Athanasius, however, finally extinguished that doubt. The local councils of Laodicea (363), of Hippo (393), and of Carthage (397) dealt with the canon, and we possess the list drawn up by the latter, which is identical with our canon to-day. From that time onwards disputes about the N.T. canon disappear, until the time of the Reformation when Erasmus, Caletan, and Luther revived doubts concerning the Epistle of James, called by Luther the 'Epistle of Straw,' because

destroy them when they were too worn for use in worship, to avoid desecration. There is, however, practically no disagreement between the thousands of MSS. that we do possess, after that date, and they bear witness to the thoroughness of the work of the Massoretic scribes who set themselves to preserve the sacred text uncorrupted, by means of textual annotations (the Massorah, or tradition), in the form which it was given early in the 2nd cent. after the fixing of the canon at Jamnia. To the Massoretes we also owe the insertion of vowel points: not Hebrew (and the revived Hebrew of modern Palestine) was written only by its consonants; and they were also responsible for the div. of the text into verses (the chapter div. was a Christian

innovation of the 13th cent. later adopted by the Jews, though not in liturgical scripts). The script used in these Heb. texts is the square Aramaic alphabet, which superseded the original Phoenician-Canaanite writing at the time of the exile, when Hebrew itself also began to become a dead language and to be replaced by Aramaic in popular use. In addition to the Massoretic text (M.T.), however, we possess a papyrus fragment witnessing to the O.T. text independently, and dating back to the late Maccabean and pre-Herodian age (the Nash papyrus containing the decalogue and the *Shema*—'Hear, O Israel,' etc.). Of similar date is the complete text of Isaiah, found in 1947 (see *SCROLLS OF THE LAW*), sealed in jars and hidden in a cave by the Dead Sea. They apparently formed part of the library of a neighbouring Essene community. This text, written in the old Canaanite script, is remarkable for its witness to the accuracy, except in minor details, of the M.T. There is also the independent witness of the Samaritan B., containing the Pentateuch only and written also in the older script. This provides an independent tradition of the text from about 400 B.C., though the oldest extant MS. is of the 12th cent. A.D. Further witness to the O.T. text is provided by the versions, of which the most important is the LXX or Septuagint (q.v.) (see above (c)), preserved and copied in a large number of MSS. by the Christian Church. The earliest almost complete texts of the LXX are contained in Codex Vaticanus (4th cent.), and in the 2 codices now in the Brit. Museum, Sinaiticus (4th–5th cent.) and Alexandrinus (5th cent.). But brief fragments of the Maccabean age have been found among the Chester Beatty papyri, and in Rylands papyrus 458. All other versions are derived either from M.T. or LXX. MSS. of the N.T. are extraordinarily numerous and early, and in fact the N.T. is far better attested than any classical author. There are no less than 53 codices containing the whole N.T., the earliest of which are the Uncials (written in capitals), Vaticanus, Sinaiticus, and Alexandrinus mentioned above. Others of great importance are Codex Ephraemi rescriptus (5th cent.) and Codex Claromontanus (6th cent.), both in the Paris National Library, and Codex Bezae (6th cent.) at Cambridge; these, however, do not contain the whole N.T. Evidence for the N.T. is also derived from the versions, chiefly from the Syriac B. (the Peshitta) which exists in texts of the 4th and 5th cents., and contains a much earlier trans. of the O.T. and N.T. We also possess the Syriac Diatessaron or Harmony of the Four Gospels made by Tatian (which existed also in Greek) in an Arabic version of the 11th cent. Coptic versions, in various dialects, also exist and we possess fragments from the 3rd and 4th cents. (Chester Beatty, and Brit. Mus. Or. 7594). Fragmentary remains survive of the Old Lat. version, going back to the 2nd cent., on which Jerome improved in his Vulgate at the

end of the 4th cent. Mention has already been made of early papyrus fragments that have been found in Egypt, and of quotations from the N.T. found in the Fathers. In all there are no less than 210 uncials, 2400 minuscules (small letter), 50 papyri, and 1610 lectionaries, from which our direct knowledge of the N.T. text is derived (F. Power, 'Languages, Texts, and Versions of the Bible,' *Catholic Commentary*, 1953). Scholars have distinguished 4 families of texts, the Western, Eastern, Antiochene, and (less certainly) the Caesarean. (c) *The English Bible*. The eagerness of the Church that the B. should be widely read and understood is shown by the number of vernacular versions produced from the first. In the W. the Teutonic languages throughout the Dark Ages had not become literary, and all who could read, read Latin. It was in England that a B. in the native tongue first began to appear, with Caedmon's partial paraphrase (c. 670), Bede's St John (735), and Aelfric's partial O.T. (990). The Norman Conquest then put an end to the growth of an A.-S. B., and the language used for literary purposes in England for some cents. was Norman-French, in addition of course to Latin. A Norman-Fr. version was produced and gained currency in due course. It was unfortunate that when an Eng. version of the whole B. did appear (an Eng. psalter preceded it) it was associated with heretical and revolutionary views, expressed in its prologue by John Wycliffe (q.v.). This made Eng. versions suspect by eccles. and civil authority for many years. Nevertheless the trans. itself was excellent and sound, and as such was not objected to. In fact it was widely used by kings, nobles, and religious once suspicion had died down. The early Wycliffe version was issued probably about 1382, and the later version in 1388, 4 years after Wycliffe's death. What part Wycliffe himself actually took in the trans. is uncertain; it is, however, supposed on fair evidence that he trans. the Gospels. The work began by the trans. of the Gospels, and this part was probably finished some 20 years before the B. was pub. The O.T. portion of the early version was probably the work of Nicholas of Hereford; the later version, probably the work of Wycliffe's successor, John Pusey, is certainly idiomatic English, a great improvement on the early version. It was also popular, and many copies survive despite the persecution of the Lollards (q.v.). These versions were the last of the MS. B.s of England. In the 15th cent. Caxton (q.v.) had introduced the art of printing into this country. The printing of an Eng. B. did not, however, immediately follow. No complete Eng. B. was printed in England before 1538. A printed ed. of the N.T. by Tyndale (q.v.) appeared in 1535, having been trans. into the vernacular and printed under difficulties. During the 10 years which followed, Tyndale also trans. and printed various other portions

of the B. The characteristic of Tyndale's trans. is his independence of the work of any other translator. The first full trans. of the Eng. B. is the work of Miles Coverdale (q.v.), who, although contemporary with Tyndale, is independent of him. Coverdale probably used in his trans. Luther's B., the Vulgate, and, from some evidence, Tyndale's. The first Eng. B. printed in England was the work of one Thomas Matthew (alias John Rogers, q.v.), the greater part of whose work is a reproduction of Tyndale and Coverdale. This B. was printed by the king's licence, and from it we get all our subsequent eds., this being taken as the standard work. The next ed. of the Eng. B. was the 'Great' B. undertaken under the patronage of Thomas Cromwell. Its title-page showed Henry VIII presenting the B. to Crammer and Cromwell, who in turn presented it to the clergy and laity. This B., printed under the supervision of Coverdale, was begun in Paris, but finished in London after an attempt to stop the printing in Paris. In 1560 appeared the Geneva or 'Breeches' B. (q.v.), at the expense of the congregation at Geneva. It was a thorough revision of the 'Great' B. The Bishops' B., printed about 1568, was undertaken as an A.V. of the 'Great' B. and was intended to drive out the Geneva B. It never succeeded in its object. There next appeared a N.T. and an O.T. trans. into English by Catholics (see MARTIN, GREGORY). The N.T. was printed at Rheims and the O.T. at Douai in 1582 and 1609-10 respectively. They had a fair amount of influence on the A.V. of the B. which appeared in 1611, and was one of the results of the Hampton Court Conference, called by James I in 1604. He suggested the revision of the Eng. B., a work to be done by the best scholars in the kingdom. The version was to be without notes, since the notes of the Geneva B. seemed to the king to be seditious and dangerous. The revisers were divided up into 6 committees, each with a special section of the B. to work upon. The whole of their work was revised by a general committee. Over 2 years were spent in that revision, and altogether the work took about 7 years. This version, in spite of the R.V., continues in general use in this country. The R.V. was the work of Convocation, which determined in 1870 that 2 committees should be formed to revise the Scriptures of the O.T. and the N.T. respectively, and with power to invite the co-operation of any eminent scholar, whatever his nationality or creed. The work ultimately became the work of Eng.-speaking non-Rom. Christians throughout the world, and was completed by 1881.

Many new versions of the B. have been produced by individual enterprise in the 20th cent., notably those of J. Moffatt (1934), R. Weymouth (1926), and of the Rom. Catholic scholars, C. Lattey (the Westminster Version) and R. Knox. In America the Standard Version and the Revised Standard have been co-operatively produced by the non-Rom.

Churches, and in Britain a new R.V. is contemplated by the Church of England.

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Bible Christians, society founded in 1815 by Wm O'Bryan, or Bryant, who was a Methodist lay preacher. The name B. C. was given to the sect because they appealed only to the Bible for the doctrines which they taught. The society was founded at Shebbear, in N. Devon, and the ministrations of the Wesleyans undoubtedly had great influence on the development of this sect. The B. C. in 1907 joined with 2 other Methodist communities, the Methodist New Connexion and the United Methodist Free Churches, to form the United Methodists. An Act of Parliament sanctioning the fusion received the royal assent in 1907. Outstanding names in their denomination are those of O'Bryan, Thorne, and Billy Bray. In 1932 the United Methodist Church, having over 2200 churches, with a total membership of over 150,000, joined with the Wesleyan Methodist Church and the Primitive Methodist Church, and became 'The Methodist Church.'

Bible Communists, founded 1848 by J. H. Noyes, and known as the Oneida Community. Their primary object was

essentially religious. They practised not only community of property and life, but by means of a system called complex marriages, community of wives also. In 1879 this system was discontinued, and 2 years later the movement became a joint stock company. It has been successful financially, but with the abolition of the complex marriage system its only really distinct feature was banished.

Bible Societies, name given to various associations which have as their chief work the trans. and propagation of the Scriptures among all nations. Such societies became prominent about 200 years after the Reformation; but previous to the Reformation, and during the period immediately following it, we find the Scriptures being trans. and to a certain extent disseminated throughout Europe. Before or during the 18th cent. the following societies were formed: The Society for the Propagation of the Gospel in Wales, 1662; the Society for Promoting Christian Knowledge, 1698; the Dan. Society for Sending Missionaries to India, 1705; the Society for the Propagation of the Gospel in Foreign Parts, 1709; the Society for Promoting Christian Knowledge Amongst the Poor, 1750; the Naval and Military Bible Society, 1780. All these had the same object in view—the spreading of Christian knowledge and the trans. and propagation of the Gospels. In Germany various bodies had been formed with the same object, and the society formed in 1792 for the Propagation of the Gospel in France was brought to an end by the Revolution. The evangelical revival of the 18th cent. naturally had a great influence on these societies in England, and led to the estab. of many new ones.

The British and Foreign Bible Society was founded in 1804. It had its origin in the difficulty which the Rev. Thomas Charles of Bala found in propagating the Gospel in Wales, owing to the lack of Welsh Bibles. The Society was formed to send out copies of the Gospels trans. into the languages of those countries which felt need of them. The versions were to be neutral as far as doctrine was concerned, and 'without note or comment.' Like all non-Anglican B. S. its Bibles never contain the Apocryphal or Deuterocanonical books of the O.T. The original society, founded in London in the year already mentioned, consisted of a committee of 36, 6 of whom were to be distinguished foreigners resident in or near London, and the remaining 30 equally divided representatives of the Church of England and of nonconformity. The society found support and developed rapidly, having at the present day 6000 auxiliary societies in England and Wales, and over 5000 abroad. It issues over 1,000,000 copies of the Bible every year, and the same number of N.T.s, besides over 10,000,000 portions of Scripture, large numbers of them among the peoples of Asia. The Bible, or parts of it, have been trans. into over 1000 languages. The society has met with many difficulties, especially from its principle of

distributing the Scriptures without note or comment, but it has in most cases been able to surmount all obstacles. One such trouble arose in 1831, when the society proposed to demand a belief in the Trinity as a condition of membership. Arising out of this the Trinitarian Bible Society was created.

Other Brit. B. S. which may be noticed briefly here are the Edinburgh Bible Society (1809) and the Glasgow Bible Society (1812). Difficulties as to the form in which the Scriptures should be pub. by the Brit. and Foreign Bible Society, led these to disassociate themselves from that body, and form in 1861 the Scottish National Bible Society. The Dublin Bible Society was founded in 1806, and afterwards, by amalgamation with kindred societies throughout Ireland, became the Hibernian Bible Society. It is associated with the Brit. and Foreign Bible Society, and contributes annually to the funds of that society. Among the more important of the European B. S. may be mentioned the Prussian Protestant Bible Society (1814), originally started as the Berlin Bible Society in 1806; the Russian Bible Society (Revel) (1807); the Swedish Bible Society (1814); and the Finnish Bible Society (1813). Most of these found considerable support in the early days from the Brit. and Foreign Bible Society. In America the Philadelphia Bible Society was founded in 1808, and gradually a number of societies grew up which by 1839 had all amalgamated into the Amer. Bible Society. The American is one of the most active of all B. S., distributing over 12,000,000 copies of the Scriptures every year, and translating these into nearly 300 different languages. The Gideons, or Christian Commercial Men's Association of America, formed at Janesville, Wisconsin, in 1899, which claims to be the oldest interdenominational laymen's evangelistic association in the world, began, in 1908, to place bibles in every hotel guest-room; and this work was followed in later years by distributions to hospitals, prisons, and the armed forces.

Biblia Pauperum, Lat. for 'poor men's Bible,' is the name given in modern times to a series of MSS. and printed books which contain crude biblical illustrations, with a short explanatory text to each picture. Very often these pictures represented events in the life of Christ, together with the corresponding O.T. prefigurations or types; the text was in rhyming Lat. verse. On an antependium or altar-front of 1181 in the Leopold Chapel of Klosterneuburg in Austria 15 scenes from the life of Christ were executed in enamels. Each scene was accompanied by 2 O.T. types. An early 14th-cent. MS. at St Florian, in Austria, is the first known to contain a similar triple arrangement. The books which contain such pictures belong to the class of block-books (q.v.).

Bibliography is derived from the post-classical Gk word *bibliographia*, which, when first used, meant the writing of

books, and was so used in France (*bibliographie*) till the 18th cent., and in England till the 19th cent. It was mainly owing to T. F. Dibdin that the change was then made in England. The usual definition of the science of B. is the systematic description and hist. of books, their authorship, printing, pub., eds., etc. B. also means any book containing these details, and its more widely used meaning is a catalogue of books by a particular author, or of the literature of a subject. B. as the science of books as such comprehends the subject and class of the work, the size, the pagination, the type, the plates, the rarity, etc. It will thus be seen that the ideal of bibliographic work is the provision in an accessible form of a comprehensive description of a copy of any book, possessing any typographical, historical, or literary interest in its original form as first pub., and of any different issues of it. The standard description of a book generally consists of the following sections: (a) a transcript of the title-page, the colophon (if any—i.e. the note of pub. at the end of a book), and any other distinguishing headings. (b) Collation, or description of the number of leaves in the book, the measurements of such leaves, and the different kinds of type employed, etc. (c) A description of the literary contents of the book, and any other detail providing some distinctive or necessary information about the particular book being described. When a bibliographer wishes to describe a book, he examines it first of all to discover its origin, and to see if it is in perfect condition. Ultra-violet rays and chemical analysis are among the scientific aids used in establishing whether a book is what it purports to be. The type also must correspond to the alleged date of the work, and a search must be made in case any leaves have been inserted from another copy in order to supply omissions. This can be discovered by observing whether the 'signatures' of the folios run on consecutively, at the foot of the eighth, twelfth, etc., page, depending on whether the book is 8vo, 12mo., etc. The 'size' of a book is the relation of the size of the separate pages to the original sheets of paper of which they formed a part. Thus when a sheet is simply folded in two the book is in folio, when in four it is in quarto, when in eight octavo, or 8vo, etc.

Of the many bibliographical catalogues already compiled by notable bibliographers, the following general ones are in most constant use to-day for establishing the identity of a book: the *Short Title Catalogue*, 1475-1640, of Pollard and Redgrave, and the continuation vols. by Wing, covering the pubs. of 1641-1700; Robert Watt's *Bibliotheca Britannica*, 1824; the *Bibliographer's Manual* of Wm Thomas Lowndes (q.v.); Hain's *Repertorium Bibliographicum*, 1826-33, and Dr Copinger's *Supplement to Hain*, 1902; the *General Catalogue of the British Museum*; the *Cambridge Bibliography of English Literature*, 1940, ed. by F. W. Bateson.

Outstanding B.s of authors are Jagard's *Shakespeare*, 1911, Michael Sadleir's *Trollope*, 1928, and Gallup's *T. S. Eliot*, 1952. Then there are B.s of books pub. during a certain period, as W. W. Greg's *Bibliography of the English Printed Drama to the Restoration*, 1939-51, or concerning a particular country, as John Ferguson's *Bibliography of Australia*, 1st vol. in 1941, or about a special subject, such as Raymond Irwin's *British Bird Books*, 1951. In this connection it should be mentioned that the catalogues of the libraries of great book collectors, and also the sale catalogues of booksellers and auctioneers, are of great value as B.s—e.g. the Harmsworth collection of Americana sold by Sotheby's, 1948-53, Michael Sadleir's *Nineteenth Century Fiction*, 1951, Lord Rothschild's Library of 18th-cent. books, and Maggs catalogue of *Sports and Pastimes*, 1950. Catalogues of libraries which serve as bibliographies of a subject include the Royal Empire Society, and the catalogues of exhibitions serve a similar purpose, such as those of the National Book League exhibitions *A Thousand Years of French Books*, 1948, *Flower Books*, 1950, and *Waller de la Mare*, 1956. Book lists and Readers' Guides are also pub. by the National Book League (q.v.) as well as other organisations, and these, as well as the reading lists at the end of books, or even chapters of books, are often called B.s, but are not strictly so as they rarely give more details than author, title, publisher, and date of a book, and sometimes price or number of pages. Other notable bibliographers than those mentioned above are T. F. Dibdin (q.v.), Sir Samuel Egerton Brydges (q.v.), R. B. McKerrow, author of the standard work on B., Fredson Bowers of the Univ. of Virginia, and Theodore Besterman, compiler of, among other things, *A World Bibliography of Bibliographies* (3rd ed.), 1955 (4 vols.).

See R. B. McKerrow, *Introduction to Bibliography for Literary Students*, 1927; J. D. Cowley, *Bibliographical Description and Cataloguing*, 1939; Arundell Esdaile, *A Student's Manual of Bibliography*, (revised ed.), 1954; and 2 pamphlets, *Bibliographical References*, Brit. Standard 1629, 1950; David Foxon, *The Technique of Bibliography*, 1955. See also the transactions of the Bibliographical Societies of London (*The Library*), Oxford, Cambridge, and Edinburgh, and the B. Society of America and of the Univ. of Virginia (*Studies in Bibliography*). See also CATALOGUING AND CLASSIFICATION.

Bibliomancy (Gk *biblion*, book; *mantia*, prophecy), name given to a method of obtaining prognostics of the future. The procedure is as follows: The person wishing to obtain information opens the book at random, and then endeavours to apply the passage displayed to the particular case. The book usually chosen now for the purpose is the Bible; the ancients used Homer or Virgil, the process being then termed *sortes Homericæ* or *sortes Virgilianæ*.

Bibliothèque Nationale, Fr. national library in Paris. There is mention of a collection of MSS. by Charlemagne, but the most famous of the early collections is that of Charles V. The library has had many homes, as, for example, at Fontainebleau under Francis I and later in Mazarin's palace. The Hôtel Tuboeuf No. 8, destined with adjoining mansions to become the B. N., was, it is said, staked at the gambling table and won by Mazarin. The vast mansion he built on the site was divided among his heirs and in its different parts was put to various uses till, in 1721, it was bought by the Crown. The king's library was then taken there from the Rue Vivienne, where it had been placed in 1666, and opened to the public. The modern part of the building, dating from 1854, has been reconstructed in recent times and enlarged. The chief entrance to the library is in the Rue du Richelieu.

The Petite Librairie of Louis XI was the true embryo of the actual B. N., or what has been successively the Bibliothèque Royale, Bibliothèque Impériale, and now the B. N.; but the B. N. owed its first real impetus to Napoleon, who increased the gov. grant; and in the opening years of the 19th cent. it had 500,000 printed vols. and 80,000 MSS., besides a great many engravings which Napoleon had taken from conquered cities. Numbers of these acquired treasures, however, were returned after the fall of Napoleon.

Acquisitions, gifts, sometimes confiscations, state seizure of the estates of *émigrés* or of the clergy during the Revolution, and, finally, the *dépôt légal* or regulation by which Francis I compelled every printer to deposit a copy of every book issuing from the press, swelled the royal library enormously, so that from a few hundreds of vols. it has to-day grown to nearly 6 million printed books, 123,000 MSS., 3,500,000 stamps, maps, periodicals, music, engravings, and works of art of various kinds connected with letters, and a considerable number of coins, tokens, and medals. From last cent. the importance of the collections determined their div. into 5 depts: Printed Books; MSS.; Stamps; Music; Medals. The Dept of Printed Books is the one that occupies the most space. In the time of the second empire it was found necessary, in order to house so large a collection, to instruct the architect, Labrousse, to transform the old premises of the library, comprising at that time a part of the Mazarin palace, the hotel de Névers, and those of Clivry and Tuboeuf; and it was then that Labrousse built his reading hall, one of the earliest metallic architectural works to be produced in France, and one of the most successful. The ceiling of the Galerie Mazarin is covered with splendid frescoes by Romanelli. The heart of Voltaire is said to be encased in the statue to be seen there. The following are among the rarest items in the Dept of Printed Books or Département des Imprimés: A Gutenberg Bible dated by the binder; a Theophrastus with *ex-libris* autographed by François Rabelais;

a copy of Pascal's *Pensées* anterior by one year to the first ed., and not carrying the corrections authorised for that ed.; a book, which belonged to Racine, adorned with sev. portraits of the great writer drawn in crayon by his son Louis; numerous prints on vellum with illuminations (see ILLUMINATION OF MANUSCRIPTS) and miniatures in the style of medieval MSS.; luxury works reserved for monarchs, one of which is adorned with a portrait of Charles VIII; and also, rare curiosity indeed, the sole copy of the book *Christianisme restitué* by Michel Servet, snatched from the stake to which he and his work had been condemned by Calvin.

After the First World War, with the fall of the franc, the library was faced with economic difficulties, but by amalgamating with other Parisian libraries under a council of management, and securing legislative action in the matter of holding funds and acquiring books, the situation was restored.

Since 1950 current books have been listed in a Supplement to *Bibliographie de France*.

Blbra, Baron Ernst von (1806-78), Ger. writer, travelled in Brazil, Chile, and Peru, and brought home good natural hist. and ethnological collections. He pub. the results of his explorations in *Reisen in Südamerika*, 1854, and also wrote works on chem. and novels remarkable for their excellence of description.

Bibulus, Marcus Calpurnius, consul with Julius Caesar in 59 bc. His efforts to oppose Caesar's agrarian law and other democratic measures being futile, he excited ridicule by spending 8 months of his consulate shut up in his own house. Appointed praconsul of Syria in 51 bc, he was afterwards (49) given command of Pompey's fleet in the Ionian Sea. In this capacity he once more proved his futility, and d. in the following year of fatigue and mortification (Caesar, *Bell. Civ.* iii. 5-18; Dio Cassius, xli. 48).

Bibury, picturesque old vil. in Glos., England, in the Cotswold Hills, about 7 m. N. of Cirencester. Pop. 600.

Bicarbonate, old name for acid carbonate. The gas carbon dioxide (CO₂) when dissolved in water is looked upon as carbonic acid, which may be represented as H₂CO₃. If both hydrogen atoms are replaced by a metal, the resulting compound is called a carbonate, as sodium carbonate, Na₂CO₃; but when one hydrogen atom only is replaced, the result is a B., as sodium B., NaHCO₃, the name being due to the fact that the proportion of the carbonic acid group to the amount of sodium is doubled. The term B. usually refers to B. of soda which is useful medicinally as a gastric sedative and antacid. See SODIUM and SODA.

Bice, name of 2 pigments, blue and green. In the natural B. formed with clay mixed with yellow ochre, the blue and green colours are due to the carbonate of copper in the B. The artificially manuf. B. is not so durable as the natural. B. is known to artists under various names, but its use is dying out.

The etymological origin of the name is obscure. See PIGMENTS.

Biceps (Lat., from *bis*, two; *caput*, head), anatomical term meaning two-headed. It is used to denote 2 muscles of the human body, one of the arm, the other of the leg. Each has 2 'heads' or points of origin. The former, the B. flexor cubiti, is the muscle on the upper arm, which serves to flex the shoulder, to flex the elbow, and supinate the forearm. The B. flexor crucis extends along the whole of the back of the thigh and flexes the knee. In popular use biceps generally denotes the muscle of the arm.

Bicester, mkt tn and urb. dist. of Oxon, England, 13 m. NNE. of Oxford. The ruins of the Rom. settlement of Alchester lie 1½ m. SW. of B., and there are remains of an Augustinian priory. There are manufs. of rope, clothing, and pale ale, and fairs are held annually in the tn. B. is in the Henley parl. div. Pop. 4220.

Biêtre, noted hospital of Paris, situated on an eminence on the S. side of the city. Founded by Louis IX as a Carthusian monastery, it was in the possession of John, Bishop of Winchester, in 1290, hence the name of B., a corruption of Winchester. Destroyed in 1632, it was rebuilt, and, after having been a hospital and a prison, became a home for indigent old men and the incurably insane.

Bichat, Marie François Xavier (1771-1802), Fr. anatomist and physiologist. *b.* Tholrette, Jura. Studied at Montpellier, Lyons, and Paris. In 1797 he was appointed lecturer in anatomy, surgery, and experimental physiology at the Hôtel-Dieu, and in 1800 he was made physician. His chief works are *Traité des membranes*, 1800, *Recherches physiologiques sur la vie et la mort*, 1800, and *Anatomie générale, appliquée à la physiologie et à la médecine*, 1801.

Bichromate Cell, see CELL, VOLTAIC.

Bickerdyke, John, pseudonym of Charles Henry Cook (1858-1933), writer. *b.* London; educ. at Baden-Baden and Cambridge Univ. In 1880 he became a barrister of the Inner Temple. His works were mainly on sporting subjects, and include *Sea Fishing*, in the Badminton Library, 1895, *Wild Sports in Ireland*, 1897, and *The Book of the All-round Angler*, 1923.

Bickerstaff, Isaac, see SWIFT, JONATHAN.

Bickerstaffe, Isaac (c. 1735-c. 1812), Brit. dramatic writer, in early life a page to Lord Chesterfield when Lord Lieutenant of Ireland. He produced, between 1756 and 1771, many dramatic pieces, which had considerable popularity, the best known being *Love in a Village*, 1762, *The Maid of the Mill*, 1765, and *Lionel and Clarissa*, 1768. Owing to misconduct he was dismissed from his post as an officer in the Marines, and had to flee the country. The remainder of his life seems to have been passed in penury.

Bickersteth, Edward (1786-1850), Anglican clergyman. *b.* Kirkby-Lonsdale, Westmorland. He was a solicitor at Norwich from 1812 to 1815, but later took holy orders, and became a secretary of the

Church Missionary Society, and in 1830 rector of Watton, Herts. His *Christian Psalms*, 1833, comprising 700 hymns, ran to over 50 eds. and was the basis of the *Hymnal Companion* compiled by his son, the Bishop of Exeter.

Bickersteth, Edward (1850-97), Anglican missionary, grandson of above, *b.* Banningham, Norfolk. He went to Delhi in 1877 to be the first head of the Cambridge Mission there, which he founded. He returned to England in 1882, and was made rector of Framlingham, Suffolk, where he remained till 1886. In the latter year he went to Japan, and was made Bishop of S. Tokyo. He worked in Japan till 1896.

Bickerton, Sir Richard Hussey (1759-1832), Eng. admiral. He took part in 1781 in the action between Hood and de Graesse off Martinique. In 1799 he was made rear-admiral, and from 1804 to 1805 was with Nelson in the Mediterranean before Trafalgar. Later he was Commander-in-Chief at Portsmouth.

Bickley, residential dist. of Bromley (q.v.).

Bicycles, see CYCLES.

Bida, tn in Niger prov. of W. central Nigeria. The Niger flows 20 m. S. Elevation, 450 ft. B. was taken by Col. F. S. Lugard (see LUGARD, LORD) in 1903 in his campaign against the N. B. is connected with Lagos by railway. Pop. 25,231.

Bidar, tn in Hyderabad state, India, which was the home of the Bahmani kings from 1428 to 1492. There are numerous fine Muslim tombs in and near the tn. It is well-known for the manuf. of Bidari ware, a traditional craft now flourishing, which consists of fine silver and gold inlay on iron.

Bidasoa, Sp. riv. which rises in the Baztán valley (q.v.) and flows into the Bay of Biscay at Fuenterrabia (q.v.). For a short distance near its mouth it forms the boundary between Spain and France, and its course was the site of sev. battles during the Peninsular War (q.v.). Length 37 m.

Bidault, Georges (1900-), Fr. politician, educ. at Paris Univ. He became a univ. prof. and leader-writer for the Catholic *L'Aube*. He had served in the First World War; in the Second he was taken prisoner, but later released and subsequently took part in resistance to the Germans. He became prominent in post-war Fr. politics as leader of the M.R.P. (Mouvement républicain populaire), and was Prime Minister in 1946 and 1949-50. As Premier, and as Foreign Minister (1944; 1947; 1953-4), he exercised considerable influence in European politics, strongly upholding Fr. national interests, while advocating a European defensive alliance and supporting projects for inter-European economic unions.

Biddeford, city in York co., Maine, U.S.A. It has large cotton manufs. and also makes textiles, textile machinery, lumber products, and shoes. It stands on the Saco, which supplies power for factories. Pop. 20,836.

Bidder, George Parker (1806-78),

engineer, was carried round the country as a 'calculating phenomenon,' until someone, interested in his extraordinary powers, educ. him at a Camberwell school and Edinburgh Univ. He was the inventor of the swing bridge for railways, and the founder of the Electric Telegraph Co., which was the first of its kind. Victoria Docks was his greatest engineering achievement, but his claim to renown rests rather on his faculty for rapid, accurate, and elaborate calculation.

Bidding-prayer (O.E. *biddan*, to pray), an exhortation to prayer often said in England in cathedrals, at univ. sermons, in the Inns of Court, and elsewhere on special occasions. Such prayers are to be found in anct. Greek liturgies, in Gallican and pre-Reformation liturgies of England, and in the Rom. Missal's Liturgy of Good Friday. The main characteristic of the Eng. B. is that it informs the congregation of the object for which they are to pray. It ends with the Lord's Prayer. The B. is commanded to be used before every sermon, lecture, or homily in the canons of the Church of England of 1603; save in the places above mentioned, it is now obsolete. Forms of B. which have been used at various times, from the 11th to the 15th cents., were collected in the *Manuale Rituale*, 1874, of the Surtees Society.

Biddulph, urb. dist. of Staffs, England, with mining, engineering, textile, and ribbon industries. Pop. 10,890.

Bideford, seaport of N. Devon, England, 8 m. SW. of Barnstaple, lying on both banks of the R. Torridge, 3½ m. above its confluence with the estuary of the Taw. An old bridge of 24 arches unites the 2 parts of the tn. Vessels of 500 tons burden can reach the quay. B. had formerly an extensive trade; it is known as the starting-place of Sir Richard Grenville's last voyage, and it also figures prominently in Kingsley's *Westward Ho!* The playing-fields were opened by the Duke of Edinburgh in 1952; there is a newly constructed art gallery, while the par. church of St Mary has many historic documents and monuments. Industries are the making of fabric gloves, sails, boat building, and leather. Pop. 10,200.

Bidens, genus of Compositae, of which 2 species, *B. cernuus*, the Nodding Bur-marigold, and *B. tripartita*, Tripartite Bur-marigold, are locally common in Britain. *B. diversifolia*, from the Argentine, and *B. striata*, Mexico, are grown in gardens.

Biddle, John (1616-62), 'the father of Eng. Unitarianism,' b. Wotton-under-Edge, Glos. In 1647 he pub. his *Twelve Arguments, etc.*, against the deity of the Holy Spirit. He was imprisoned, but next year pub. his *Confession of Faith touching the Holy Trinity, etc.*, and he followed this by a tract bringing the fathers of the Church to support him. In 1655 B. was banished to the Scilly Is., where he stayed for 3 years. After the Restoration he was again brought to trial, and fined heavily. He was unable to pay, and so was sent to prison, where

he d. See his life by J. Toumin, London, 1791.

Bīḍpai, or Pīlpay, legendary Indian philosopher, to whom a famous collection of E. apologies known as *The Fables of Bīḍpai* was once attributed. According to tradition, this B. (the title, derived from the Sanskrit, means master of knowledge) lived under a king called Dabshelim, by whom he was imprisoned, because of his free condemnation of the royal tyranny. He was later released to discuss the affairs of the kingdom, and was then commanded to write down his advice in Sanskrit in fable form. The fables early became popular, and the news of them having reached Persia the King Khorsh Anushirvan (6th cent. AD) sent Barzoi, his court physician, into India to make a collection of them, and to translate them into Pahlavi. The physician made this trans. under the title *Katīlah and Dimnah*, from the names of 2 jacks in the Sanskrit version. From the Pahlavi a trans. into old Syriac was made, and the same version was again made the basis of a more important trans. about AD 750. Then Abdullah-bn-al-Mokaffah turned it into Arabic, and it was from this version that the fables were trans. into most of the European languages. The chief sources of the *Fables of Bīḍpai* are the *Pancha Tantra* and the *Hilopadesa*. The stories, which made animals speak and reason as human beings, are didactic in aim, their purpose being to infuse Buddhist doctrine, in the same way as do the *Jataka*, or birth stories, of the Buddha, with which the fables have much in common. The fables were trans. into Hebrew by the Rabbi Joel, and from this work was trans. the *Directorium Vitae Humanae* of John of Capua, a converted Jew. This was trans. into Italian, and from the Italian into English by Sir Thomas North, 1570. There have been about 20 Eng. trans. during the last cent. See J. G. N. Keith-Falconer's *Katīlah and Dimnah*, Cambridge, 1895.

Biedermann, Friedrich Karl (1812-1901), Ger. historian and politician, b. Leipzig. He was one of those who went to Berlin from the Frankfurt assembly of 1848 to urge the King of Prussia to constitute himself Ger. Emperor. He took a leading part in Saxony in the movement in favour of the unification of Germany, and was a member of the Reichstag, 1871-4.

Biel (Fr. Bienne), important industrial tn in the canton of Bern, Switzerland, 20 m. NW. of that city. Overlooked by the Jura, it is pleasantly situated on the lake of B. Gardens and villas enfold the tn, which is composed of an old and a modern quarter, the one semi-medieval in its irregularity, the other modern in its regular elegance. From 1362 to 1352, B. belonged to the Bishops of Basel; in 1352 it was allied to Bern, and was a free and independent city until 1798, when France seized it, but in 1815 it was again united to Bern. Its industries are watch-making, the manuf. of machines, cotton-spinning, cigar-making, tanning, and dyeing. Pop. (1955), 52,300.

Biela, Wilhelm, Baron von (1782-1856), Austrian army officer, and amateur astronomer, b. Rossau. On 27 Feb. 1826 he discovered a faint comet when he was at Josephstadt, Bohemia; and it was not known at this time that this comet had been seen on 2 previous occasions, in 1773 and 1805. It became known as B.'s comet. According to prediction from its computed orbit it returned in 1832, and it was seen again in 1845 when it split into 2 parts; on the return of the double comet in 1852 these parts had separated further. In 1872, when it was expected to return, there was a wonderful display of meteors on 27 Nov., and this shower has been repeated each year about the same date. These meteors are the debris of B.'s comet which has been spread along its track; the earth encounters this debris each Nov.

Bielaya, see BELAYA.

Bielsfeld, Ger. tn in the Land of N. Rhine-Westphalia (q.v.), at the foot of the Teutoburger Wald (q.v.), 93 m. NE. of Düsseldorf (q.v.). It belonged to the Hanseatic League (q.v.), and it has been a centre of the linen industry since shortly after the Thirty Years War (q.v.). During the Second World War it was severely bombed in 1941 and 1945. There is an ancient castle and a fine 14th-cent. church. The *Anstalt Bethel*, a remarkable charitable institution founded in the tn at the end of the 19th cent., takes in people of many different kinds who are in need of care; it has had as many as 6000 inmates at one time. In addition to the linen industry there are motor-cycle, sewing-machine, cash-register, and paper industries, and the tn is a publishing centre. **Horst Wessel** (see HORST WESSEL LIED) was b. here. Pop. 171,150.

Belgorod, see BELGOROD.

Bieltz, see BIELTZO.

Biella, It. tn, in Piedmont (q.v.), on the Cervo. It has many ancient buildings, including a 10th-cent. baptistry and a 15th-cent. cathedral. There are important woollen manufs. Pop. (tn) 27,200; (com.) 43,000.

Bielsostok, see BIALOSTOK.

Bielsk (-Podlaski; Russian Belisk) of Poland, in Bialystok prov., 25 m. S. of Bialystok (q.v.). It has an agric. trade, and cement and textile industries. Pop. 6300.

Bielski, Martin (c. 1495-1576), Polish chronicler. His *Kronika Polska* was the first book of chronicles written in the Polish language, and is the first important hist. of Poland, still having some historical value.

Bielsko (-Biala; Ger. Bieltz), tn. of Poland, in Stallinograd prov., on the R. Biala, 29 m. S. of Stallinograd (q.v.). It has an ancient textile industry, and chemical and engineering manufs. Pop. 26,000.

Bien-hoa, cap. tn of the prov. of the same name and situated on the l. b. of the Dong-nai riv. (q.v.), 20 m. NE. of Saigon (q.v.) in Cochinchina (q.v.). There is a Vietnamese school of art and sculpture, the remains of an old citadel, and a temple containing a 15th-cent. gilded

stone statue of Vishnu (4 arms) of Cham workmanship. B. produces rubber, rice, vegetables, and fish. It is connected by road and rail to Saigon and has a small airfield.

Bienna (Switzerland), see BIEL.

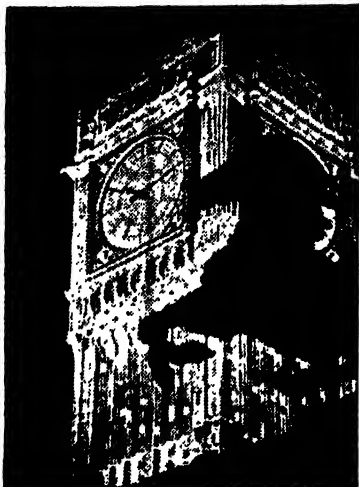
Biennials, plants which require 2 seasons of growth from the seedling to the production of ripe seed. In the first year they produce only vegetative shoots, in the second, flowers, fruits, and seeds, after which they perish. See GARDENING.

Bienteveo, see BENTIVI.

Bienville, Jean Baptiste le Moyné, Sieur de (1680-1768), Fr. governor of Louisiana, b. Montreal, Canada. He founded New Orleans in 1718, and estab. there the seat of the gov. He was obliged to return to France (1725) to answer accusations made against him; but he returned (1733) as lieutenant-general. He failed in a number of expeditions against the Indians and asked to be relieved of his duties. He d. in France.

Bierbaum, Otto Julius (1865-1910), Ger. poet, novelist, and critic, b. Grünberg, Silesia. He studied philosophy, law, and Chinese, but took up journalism in Munich. In 1899 he founded the literary jour. *Die Insel*, out of which grew the famous *Insel-Verlag*. He gained an outstanding success with his poems *Der Irrtum der Liebe*, 1901 (revised ed. 1906), combining traditional themes with modern impressionistic verse technique. His prose works are mainly humorous, or grotesquely satirical, notably *Prinz Kuckuck* (3 vols.), 1906-7. See G. Conrad, *O. J. Bierbaum zum Gedächtnis*, 1912.

Bierce, Ambrose Gwinett (1842-c. 1914), Amer. author, b. Ohio, son of a farmer, and the youngest of 12. He enlisted in the Union Army at the outbreak of the Civil war, 1861. After distinguished service he was invalided out in 1865. He then joined his brother Albert in San Francisco, and found his way into journalism. In 1872 he came to London, and was on the staff of *Fun* for 4 years. Under the pseudonym 'Dod Grile' he collected 3 vols. of his journalistic ventures. From 1876 to 1897 he was a journalist in San Francisco. In 1891 his first book of stories, *Tales of Soldiers and Civilians*, was pub., notable for his capacity to see war in all its horrors. In 1897 he went to Washington as newspaper correspondent, remaining there until 1913, when he disappeared into Mexico, then in the throes of civil war. A last letter was received from him in Dec., saying he was attached to Villa's army. Nothing is known beyond that date. One story states that he was shot by Villa himself. His books include *Cobwebs from an Empty Skull*, 1874, *Tales of Soldiers and Civilians*, 1891, *Can Such Things Be?*, 1893, *Fantastic Fables*, 1899, *The Cynic's Word Book*, 1906, and *The Shadow on the Dial*, 1909. A self-edited collected ed. was pub. 1908-12. See J. McWilliams, *Ambrose Pierce*, 1929, and J. H. Grattan, *Bitter Pierce: A Mystery of American Letters*, 1929.



BIG BEN'S CLOCK TOWER

The sculptured horse is part of the Boudicca statue group at the north end of Westminster Bridge.

Bier's Congestion Treatment, method of dealing with certain diseases by inducing an increased supply of blood in the part affected, whether arterial or venous. His general name for the former treatment is the artificial production of active hyperaemia, as opposed to passive hyperaemia artificially produced, which includes all methods of hindering the departure of the venous blood from the part affected. Both treatments are based on the principle of assisting nature by increasing the supply of the blood, and consequently of those agencies whose function it is to resist and overcome the disease producing elements in the particular part of the body affected. The prin. method of producing active or arterial hyperaemia is the application of heat. (See also AEROTHERAPIES.) The apparatus used by Dr Bier (A. V. Bier, Ger. surgeon, 1861-1949) and his assistants for this purpose consisted of hot-air boxes adapted to enclose the different extremities, the openings being well packed with fireproof asbestos cotton. The source of heat was a Bunsen burner or a spirit lamp which could be regulated. A thermometer was fitted to the box so that the temp. could be continually under observation. The usual effect of the treatment was to produce a copious perspiration. In the case of the passive hyperaemia treatment, Dr Bier achieved his object by carefully applying a bandage ('Bier's bandage') to the limb in such a way as to slow up the venous return without seriously interfering with the main arterial flow.

Bierstadt Albert (1830-1902), Amer. artist, b. Solingen, near Düsseldorf, who at the age of 2 was taken to America by his parents. He went back to Europe to study at the academy of Düsseldorf, 1853-7. Returning to America he took part in General Lander's expedition across the Rocky Mts. As a result of this trip his picture of 'Lander's Peak' attracted attention at the Paris Exposition of 1863. 'The Discovery of the Hudson River' and 'The Settlement of California' are in the Capitol, Washington.

Big Ben, great bell in the clock tower of the Houses of Parliament, Westminster. It was so named after Sir Benjamin Hall, who was first commissioner of works in 1858 when it was cast. It cost some £40,000 and weighs 13½ tons. A light is displayed from this tower when Parliament is sitting.

Big-bud, swelling of the buds of plants, particularly of black-currents and nuts, caused by infestation by gall mites.

Big Game. The pursuit of the larger fauna has had a fascination for men in all ages; anct cave-dwellers, Assyrian kings, and modern sportsmen have all taken pleasure in hunting and in recording their adventures. But to-day, instead of finding the bear, elk, or aurochs close at hand, the European hunter must go far afield if he desires to pursue B. G.

Africa. Formerly game, large and small, was abundant in N. Africa; now, except in national parks and reserves, only a few small buck remain. The best African hunting-grounds of the present day are in Kenya and Tanganyika, but a fair amount of game is to be had in N. Rhodesia, Uganda, and the Sudan. In most of the above territories elephant, rhino, and buffalo are still plentiful, and lion can be got (but not so easily, for lions receive special protection in areas where they do no harm). The picturesque days of native porters are past and their place has been taken by the safari lorry and ubiquitous Land Rover or jeep. The expenses of a modern hunting trip are in any case considerable, and, if the sportsman desires a full-dress safari with a first-class white hunter and all the latest luxuries, can run up to £1000 a month. Specimens of the animals already mentioned should be obtained on a month's trip, together with hippopotamus, eland, and a large variety of the smaller antelopes. Most safaris outfit in Nairobi, get licences and permits, and then go by road to the area chosen for shooting. The cost of a visitor's licence varies according to the different territories but is usually in the neighbourhood of £50. An additional special licence is necessary to shoot elephant or rhino. If a sportsman wants a particular trophy, such as white rhino, giant sable, or nyala, a special journey will be necessary. Careful inquiries should be made before setting out, for certain animals may suddenly be subject to special legislation prohibiting all hunting on account of their rarity. There are, however, less expensive ways of seeing B. G. in its natural surroundings, and most African countries have estab.

National Parks where wild animals can be seen, studied, and photographed. The majority of National Parks have camps from which a system of tracks covers most of the country. All game quickly loses its fear of motors and it is not uncommon for lions to scratch themselves on the bumper bars of onlookers' cars. The days are past when an attack of fever was almost certain, and provided the sportsman remembers to take one of the modern antimalarial prophylactics regularly, he should run no risk.

India has always been famous for its wild animals, but enjoying the best sport is expensive. There is an immense variety of game, tiger, leopard (or panther), lion, wild boar, rhinoceros, and buffalo, besides deer and gazelles, from the lordly sambur downwards. The tigers are unmatched elsewhere; one was shot which measured 10 ft 2 in. in length, including tail, and weighed 540 lb. Tigers are to be found in many parts of India, but especially in the Terai jungles (along the foot of the Himalaya), and in the Sundarbans. They are generally shot when sitting up over a kill, from elephants, but sometimes from trees, towards which they are driven by beaters. Lions are preserved in the W. and are sometimes of great size. Leopard (or panther) are numerous: the snow leopard of the Himalaya is one of the finest prizes a sportsman can secure. Rhinoceros are found in the Terai and Assam, and the gaur, or Indian bison, in the Sātpurā and other mt ranges. One of the most noted sports of India is 'pig-sticking,' or hog-hunting (q.v.). The Indian buffalo, living in swampy dists. overgrown with tall reeds, has to be hunted on elephants, and may be taken on the fresh grass which comes up after burning, though dense dry patches of grass may be burned off to bolt a wounded animal. Up in the Himalaya those who enjoy mountaineering may stalk the markhor, ibex, and wild goat; brown and Himalayan bears, and snow leopards, are sometimes met with. At a great altitude (10,000-17,000 ft), the bharal, or blue wild sheep, needs expert stalking, and furnishes excellent mutton. Burma also affords plenty of sport, its fauna including the elephant, rhinoceros, tiger, and leopard, besides innumerable deer. Elephant-shooting, however, is strictly prohibited both here and in India, though proscribed rogue elephants, for which a reward is offered, are the sportsman's usual, and legitimate, quarry.

Europe. Good shooting may be had in some parts of Europe, especially Russia, Scandinavia, and the Alps. In Russia, wolves and bears are plentiful, and their skins are prized. Further S., in the Caucasus, wild boars abound on the lower slopes, and bears and bison are also found. Higher up there are chamois, ibex, and other mt game; but though sport is plentiful it is expensive, and involves much difficult mountaineering. Bison are now being reintroduced into various parts of the European continent. Chamois and ibex are stalked also in

Switzerland, the Tyrol, the Carpathians, and the Pyrenees. In Scandinavia the brown bear is hunted, though bears in Norway are now scarce.

America. In N. America the hunter may find abundant sport, and the great herds of bison have been re-established in Canada and the U.S.A. The black bear is becoming scarce, having been killed for his fur, but in the Rockies grizzlies and other bears are still to be found. Canada is rich in game, moose and caribou being the largest; these are also found in parts of the United States. Newfoundland also became noted as a shooting ground, but in E. Canada as a whole B. G. is becoming scarce. The 'bighorn,' rare elsewhere, is now preserved in Brit. Columbia and Kootenay; it is difficult to stalk. Musk-oxen are found in the N., and some bison, and the Alaskan bears are almost as large as the grizzly. There is good shooting in S. America, but the country is difficult. The chief animals are the jaguar, puma, many kinds of smaller game, including wild pig, and on the plains there are herds of wild cattle. See F. C. Selous, *A Hunter's Wanderings in Africa*, 1881; F. Nansen, *Farthest North*, 1893-6; Sir A. E. Peace, *The Book of the Lion*, 1913; C. Phillips-Wolley, *Big Game Shooting*, 1913; H. F. Wallace, *Big Game of Central and Western China*, 1913; J. H. Patterson, *Mancaters of Tsavo*, 1914; W. D. M. Bell, *The Wanderings of an Elephant Hunter*, 1923; D. D. Lyell, *Memories of an African Hunter*, 1923; V. Stefansson, *Hunters of the Great North*, 1923; Lord Baden-Powell, *Pig Sticking or Hog Hunting*, 1924; R. Lydekker and J. G. Dollmann, *Game Animals of India, Burma, Malaya, and Tibet*, 1924; J. Ross and H. Gunn, *The Book of the Red Deer and Big Empire Game*, 1926; A. R. Dugmore, *African Jungle Life*, 1928; M. Johnson, *Safari*, 1928; K. Kittenberger, *Big Game Hunting and Collecting in East Africa*, 1929; Dunbar Brander, *Wild Animals of Central India*, 1931; R. G. Burton, *Sport and Wild Life in the Deccan*, 1932; J. W. Best, *Forest Life in India*, 1935; E. Hemingway, *Green Hills of Africa*, 1936; K. Gandar Dower, *The Spotted Lion*, 1937; J. Corbett, *Mancaters of Kumaon*, 1946; A. Locke, *Tigers of Trengganu*, 1954.

Big Horn: 1. Co. in the NW. part of Wyoming, U.S.A., drained by the Bighorn R. and its tribs. On the E. are the Bighorn Mts. on the W. the Shoshone Mts. Stock-raising and agric. pursuits are carried on, and a system of irrigation is generally practised. The cap. is Basin. The dist. has an area of 3176 sq. m. Pop. 13,176.

2. Co. in S. Montana, U.S.A., drained by Bighorn and Little Bighorn R.s. It is the site of the Custer Battlefield National Monument.

Big Horn Mountains, see BIGHORN MOUNTAINS.

Big Horn River, see BIGHORN.

Big Horn Sheep (*Ovis canadensis*), species of large N. Amer. sheep with a brown

coat, which turns to bluish grey in winter; so named from the size of the horns of the ram, which often measure over 40 in. round the curve. The sheep are also named Rocky Mountain sheep.

Big Sandy River: 1. In Arizona, U.S.A., formed by confluence of 3 forks at Hualpa Peak; it flows c. 80 m. to join Santa Maria R. and form Bill Williams R. 2. In NE. Kentucky and W. West Virginia, U.S.A., formed at Louisa, Kentucky, by junction of Tug Fork and Levisa Fork; it flows 27 m. N. to the Ohio R. at Cynthiana, Kentucky.

3. In W. Tennessee, U.S.A., rises N. of Lexington in Henderson co. and flows 65 m. N. to Kentucky Reservoir.

Bigamy. In Eng. law, by the Offences against the Person Act, 1861, sec. 67, 'Whoever, being married, shall marry any other person, during the life of the former husband or wife, whether the second marriage shall have taken place in England or Ireland or elsewhere, shall be guilty of felony, and being convicted thereof, shall be liable to be kept in penal servitude for any term not exceeding 7 years'; but no offence is committed: (1) if the second marriage is contracted by a person not a Brit. subject outside England and Ireland; (2) if the former husband or wife has been continually absent for 7 years, and is not known to be living by the person marrying a second time; (3) if the first marriage has been dissolved by a divorce or a decree of nullity; (4) if there was a *bona fide* belief based on reasonable grounds that the former husband or wife was dead. To support a charge of B. a valid first marriage must be proved; thus if a man marries a woman while his first wife is alive and after the first wife's death marries a third, the last marriage is not bigamous, for his second marriage was a nullity. In Scotland, by the statute of 1661, the offence is one of perjury; at common law B. is punishable as an offence with imprisonment.

In U.S.A. law the statutory provisions of the various state criminal codes against B. or polygamy (q.v. as to Utah) are for the most part copied from the statute of 1803 (replaced by the Criminal Law Consolidation Act, 1861). The various exceptions to this statute are likewise practically the same in the Amer. Acts, e.g. continuous absence of former spouse for a space of 5 years, without being heard of; dissolution of former marriage by decree of a competent court, etc. Punishment for the offence differs in different states. In cases where the prior marriage was made abroad, the prosecution must show that such marriage was valid by the law of the country where it was made. The second marriage must be within the jurisdiction; if in a foreign state it is not B. Again, the second marriage need not be a valid one. Even though the first marriage be contracted under any of those disabilities or impediments which render it *voidable*, yet a second marriage, whilst the former is in fact subsisting, comes within the criminal law, for the first is a marriage in legal

theory until it is avoided. But if the first marriage were contracted under disabilities or incapacities which rendered it void *ab initio*, the case is otherwise. In Maine, Pennsylvania, and other states, the defendant's admissions as to a former marriage may be given in evidence against him, but apparently this is not so in Massachusetts, Connecticut, and a few other states. Consummation is not necessary to the validity of either marriage. The fact, if so, that polygamy is allowed by any religious creed is not, even in Utah, a defence in law to a charge of B. As in England, so in U.S.A., a woman who, having a husband living, marries another person is guilty of B., even though her husband has voluntarily withdrawn from her and remained both absent and unheard of for any period less than 7 years, and even though she honestly believed him to be dead at the time of her second marriage.

Bigelow, Erastus Brigham (1814-79), Amer. inventor, contrived, whilst still a boy, a loom for weaving suspender webbing and piping cord. His other inventions were a machine for making knotted counterpanes and a power-loom for the carpet weaver, which reduced the cost of carpet manuf.

Bigelow, Jacob (1787-1879), Amer. physician and botanist, graduated in 1806 at Harvard Univ., where he was afterwards prof. In more than one capacity. For more than 40 years he practised medicine in Boston. His title to renown rests on his original research in botany, as well as on his introduction of single-word nomenclature in the *U.S. Pharmacopoeia*, 1820. His best work was *American Medical Botany* (3 vols.), 1817-30.

Bigelow, John (1817-1911), Amer. journalist and statesman, b. Malden, New York. From 1849 to 1861 he was managing editor and, with Wm Cullen Bryant, joint owner of the *New York Evening Post*. Amongst the offices which he filled in his political career were United States consul at Paris, 1861-4, minister to France in 1865-6, and secretary of state for the state of New York, 1875-7. His best work is his ed. of Franklin's *Autobiography and Complete Works*, to which he added notes based on personal knowledge. See Margaret Clapp, *Forgotten First Citizen: John Bigelow*, 1947.

Biggar, burgh of Lanarkshire, Scotland, 27 m. SW. of Edinburgh. It consists mainly of one lengthy street, and has a cruciform church with a tower in the middle. Pop. 1435.

Biggarsberg, range of mts in S. Africa, which are an easterly extension of the Drakensberg Mts. separating the N. part of Natal and the dist. of Newcastle from the rest of the colony. The area is rich in coal and iron ore.

Biggers, Earl Derr (1884-1933), Amer. novelist, b. Warren, Ohio. After studying at Harvard he worked as a journalist in Boston. He scored a great success with his mystery novel, *Seven Keys to Baldpate*, 1913, and later broke from

tradition in the detective story by introducing a Chinese investigator, Charlie Chan, who figured in sev. novels, *The House Without a Key*, 1925, *The Chinese Parrot*, 1926, *Behind that Curtain*, 1928, *The Black Camel*, 1929, *Charlie Chan Carries On*, 1930, and *The Keeper of the Keys*, 1932. Others of his novels were *Love Insurance*, 1914, *The Agony Column*, 1916, and *Fifty Candles*, 1928.

Biggleswade, urb. dist. and mkt tn in Beds, England, on the r. b. of the Ivel. It has a large weekly corn market, and there are many market gardens in the neighbourhood, which send their produce to London. It manufs. agric. implements, hosiery, caravans, and machine tools, and has a large brewery, and bookbinders. Pop. 7421.

Bigham, John C., see MENSEY, BARON. Bighorn, riv. of the U.S.A., formed at Riverton, central Wyoming, by the confluence of the Popo Agie and Wind rvs.; it flows 460 m. N. to Yellowstone R., of which it is the largest affluent. Tribs. are the Shoshone and Greybull rvs., Wyoming, and the Little B., Montana. Plans for development of Missouri R. Basin include 2 projects on B. R.: Boysen project, including Boysen Dam (now under construction), and Hardin project, with Kane and Yellowtail dams.

Bighorn Mountains, range of Rocky Mts lying principally in the N. part of Wyoming, U.S.A., on the E. of the Bighorn R. They are composed of anct sedimentary rocks with a granite nucleus. The range runs in a NW. and SE. direction for nearly 190 m., and has a number of summits over 10,500 ft covered by perpetual snow. There are live-stock grazing and irrigated agriculture in the foot-hills. Bighorn National Forest, in the Wyoming part of the range, contains large stands of pine, spruce, and fir. The Sioux, the most belligerent of the Amer. Indians, had their fastnesses in these regions for a long time. In this dist., 15 m. to the S. of Fort Custer, occurred the famous massacre of the Little Bighorn in 1876, when a United States Army detachment under Gen. Custer was annihilated.

Biglow Papers, The, see LOWELL, JAMES RUSSELL.

Bignonia (named in honour of Abbé Bignon, librarian to Louis XIV, 1662-1743), family Bignoniaceae; a genus of which *B. unguis-cat*, a Brazilian tendril climber, with bell-like, yellow flowers, is now the chief species for stove-houses.

Bignoniaceae, family of dicotyledonous, tropical or sub-tropical trees, shrubs, or herbs, of which typical genera are *Bignonia*, *Campsis*, *Catalpa*, *Colea*, *Eccremocarpus*, *Incarvillea*, *Jacaranda*, *Pandorea*, *Spalhodea*, *Stereospermum*, and *Tecoma*.

Bignor, vil. of Sussex, England, 5 m. from Petworth. The extensive remains of a Rom. villa, occupied during the 2nd to 4th cents. AD, and discovered in 1811 by an ancestor of the present owner, are still in excellent condition and contain some of the finest mosaics in the country. Pop. 130.

Bigod, Sir Francis (1508-37), Eng. knight, educ. at Oxford. He served Cardinal Wolsey, and later Thomas Cromwell, but later joined the Pilgrimage of Grace (q.v.). He was hanged at Tyburn after leading the ineffectual rising at Beverley. Some of his letters may be seen at the Public Record Office.

Bigod, Hugh and Roger, see NORFOLK, EARLS OF.

Bigorre, Fr. dist. formerly in the prov. of Gascony. It now forms part of the dept. Hautes-Pyrénées. The cap. is Tarbes.

Bihac, tn in Bosnia-Herzegovina, Yugoslavia, on the Una. Frequently under siege in the Turkish wars, it has many anct buildings, including a Gothic church which has been converted into a mosque. Pop. 9000.

Bihar: 1. State of India, embracing some of the most fertile land in the lower and middle Ganges Valley above Bengal. It extends from the Himalayas to about 100 m. from the Bay of Bengal and is bounded on the N. by Nepal, on the W. by Uttar Pradesh and Madhya Pradesh, on the S. by Orissa and on the E. by W. Bengal. Most of the area is very thickly populated plain, with heavy rainfall and varied temp. and vegetation.

History. B. figures prominently in the most notable eras of Indian hist., being the scene of Buddha's enlightenment and mission; later, it was the Magadha of the Mauryas, the Sungas and Guptas; and Patna (as Pataliputra) was the cap. At Pataliputra court lived and worked men like Kalidasa, the playwright, and Aryabhata, the mathematician, and from here Indians went forth to preach Buddhism while Chinese and other pilgrims came to study at Nalanda Univ. B. came under the Delhi sultans in the medieval period and later under the Moguls. In the mid-18th cent., the Mogul emperor gave the E. India Co. the *diwani* or revenue administration of Bengal and B. From 1912 to 1936, B. and Orissa were one prov., Orissa being separated in 1936. In Aug. 1942 B. was the scene of widespread disturbances after the 'Quit India' resolution of the Indian National Congress, and for a time sabotage cut B. off from the rest of India by rail, road, and telegraph. The army had to take drastic action to reopen lines of communication with the Burma front. Again, in 1946, the communal riots from Bengal spread to B., and for a fortnight there was wholesale bloodshed in sev. cities in retaliation for Muslim excesses in Bengal.

Development. B. grows rice, wheat, maize, barley, gram, sugar, jute, chillies. It possesses some remarkable industrial enterprises—Tata's iron, steel, and allied enterprises at Jamshedpur (q.v.); the fertiliser factory at Sindri; many coal-fields, Jharia being the chief; deposits of iron ore and many other minerals, B. providing much of the world's mica; a big cigarette factory; sugar factories, etc. Multi-purpose riv. schemes in the Damodar and Kosi valleys will no doubt lead to further development in the future.

Culture. Bihari is the language of B., but Hindi is universally understood. Many people speak Bengali and Oriya. Holding many of the holiest Hindu and Buddhist sites, the state is overwhelmingly Hindu in pop. Both the state's univs., those of Patna and of Bihar, have their H.Q. at Patna.

Government. The governor acts through ministers responsible to an elected assembly of 330. B. has 21 representatives in the Upper and 53 in the Lower House of India's Parliament.

The cap. is Patna (pop. 283,000). Other big tns are Jamshedpur (pop. 218,000), Gaya (pop. 134,000), Bhagalpur (pop. 115,000), and Ranchi (pop. 107,000). Area 67,830 sq. m.; pop. 38,930,000.

2. City of B. state, India, a transport centre in the dist. of Patna, 35 m. SE. of Patna. There is a trade in rice, corn, and oil seeds. Silica is mined locally, and textiles are manu. Near by are the ruins of Hindu, Buddhist, and Mogul buildings. Pop. 55,000.

Bihari, Alexander (1856-1906), Hungarian painter, b. Grosswardein. His most famous pictures are 'Gypsies with the Broken Violin before the Country Justice,' 'A Pleasure Trip on the Zagryva,' 'Peasants at Supper on the Pusztas,' and 'A Rumanian Funeral.'

Bihe, dist. in Portuguese W. Africa, situated about 12° 40' S. and 17° E. It lies at an altitude of 5300 ft above the level of the sea, and has a sufficiently mild climate to allow of the cultivation of corn and other crops. The Benguela-Katanga railway connects B. with the coast.

Blak, see BIRSK.

Bijapur, Bombay state, India. It was at B. in AD 1490 that Yusuf Khan estab. the Adil Shah dynasty of B. kings which survived till 1686 when the city was taken by Aurangzeb. B. contains one of the finest collections of Muslim ruins in India. In particular the great hall, the mausoleum of Mohammed Adil Shah, 7th king (1626-56), is reputed to be the largest domed space in the world.

Bika, see COLE-SYRIA.

Bikaner, formerly a leading Indian princely state (q.v.), now part of Rajasthan. It lies in the less inhabited area of Rajputana to the N. of Jodhpur. The city was founded in AD 1488 by the ancestors of the present princely family; it is surrounded by a battlemented wall and is the fourth largest city in Rajputana. The fort to the NE. of the city was begun in the period 1571-1611, and contains a fine library of Sanskrit and Persian books. Maharaja Sir Ganga Singh, who himself commanded the famous Camel Corps in China in 1900, ruled from 1887 to 1943 and was one of the best-known Indian princes in Europe. He attended the Imperial War Conference in 1917 and 1919 as a representative of India, was a member of the War Cabinet, and a delegate to the peace conference. He was also the first chancellor of the Chamber of Princes from 1921 till 1928. He was the first Indian prince to be made a full general in the Brit. Army. Ganga Singh

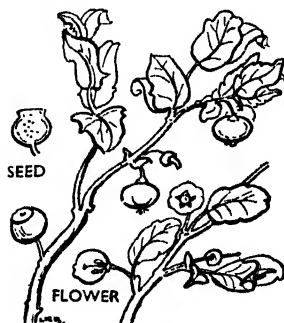
was succeeded by his son, Sri Sadul Singhji Bahadur.

Bikelas, Demetrius (1835-1908), Gk poet. He drew his inspiration chiefly from the Klephtic songs, and used the Epirotic dialect. His poems are characterised by grace of style and imagination.

Bikh, Bish, or Vish (Hindu, 'poison,') name given to the herbaceous perennial *Aconitum ferox*, which grows in the Himalaya; or, more specifically, to the fatal poison extracted from this plant. *

Bikrampur, anct tn of Dacca, Pakistan, formerly the seat of gov. of the Hindu kings of Bengal, and now an educational centre.

Bilhao (anct Belvaso; Eng., obsolete, *Bilhoa*), Sp. port., cap. of the prov. of Vizcaya, on the Nervion. It is on an inlet of the Bay of Biscay, and is surrounded by mts. B. was founded in the 13th cent., and became prosperous with the growth of the Sp. empire. It suffered in the Peninsular war and in the Carlist wars. At the outbreak of the Civil war in 1936 it was held by the gov. forces, and was taken by the insurgents in 1937 after severe fighting. The picturesque old tn, with its churches and monasteries, is on the r. b. of the riv., and is united by fine bridges to the new tn, with its broad business streets, parks, and squares. There is a (non-State) univ., and there are museums and learned societies. B. is a great commercial centre, and one of the chief ports in Spain; it has, actually, two ports, one on the riv. estuary and one a deep-water port used by transatlantic liners. It owes much of its prosperity to the rich iron deposits in its vicinity. In the Middle Ages it was famous for sword blades, and it still has important iron and steel works. Among its other industries are shipbuilding, and the manu. of chemicals, glass, and paper. Pop. 238,800.



BILBERRY

Bilberry (*Vaccinium myrtillus*), plant belonging to the Ericaceae, which is found on moors and hilly woodland dists. It has deciduous leaves and edible blue berries. Other names for it are whortleberry, huckleberry, and blaeberry.

Bilbills, a not in of Spain, remains of which still exist near Calatayud (q.v.). In Rom. times it was famous for weapons, and had baths called Aquae Bilbilianae. *Martialis* (q.v.) was b. here.

Bilboa, see **BILBAO**.

Bilboes, fetters formerly used for offenders on board ship. This word and bilbo, a sword (both Shakespearean), were derived from the Sp. tn Bilbao, or Bilboa, noted for its iron and steel.

Bilderdijk, Willem (1756-1831), Dutch poet and scholar, b. Amsterdam. He studied at Leyden, and after taking his doctorate in law, he started practice at The Hague. When, in 1795, the French invaded Holland, he quitted the country. After a visit to Germany, he took up his residence in London. Here he had a love affair with one of his pupils, Katharina Schweickhardt, whom he married in 1802, having divorced his first wife. In 1806 he returned to Holland, where he was well received by Louis Napoleon, who made him his librarian. On the abdication of Louis he fell into poverty, in which he d. B. was a follower of Gk and Fr. classicism. He wrote nearly a hundred works, conspicuous for their command of language. His chief poetical works are *Het Buitenleven*, 1803, *De Ziekte der geleerden*, 1807, and the unfinished epic *De Ondergang der eerste wereld*, 1820. See J. Smit, *Bilderdijk et la France*, 1929, and A. Heyting, *W. Bilderdijk als Dichter*, 1931-40.

Bile, fluid secreted by the liver. Human B. is yellowish-brown or green in colour, is of a viscous nature, has a sp. gr. of 1010 (water=1000), a bitter taste, an alkaline reaction, and a sickly odour. The quantity secreted by the liver averages 500-600 grains per 24 hrs, but may amount to as much as 2400 grains. B. consists mainly of B. salts and B. pigments, with small quantities of fats, cholesterol, and leucithin. The most important B. salts are sodium glycocholate and sodium taurocholate. The pigments are biliverdin, which is green in colour, and bilirubin, which is reddish. The former is most abundant in herbivorous animals, the latter in flesh-eaters, and the colour of the B. is determined by the relative proportions of these pigments. Both are waste products of the used-up haemoglobin in the blood, the iron from which is, however, retained for further use. B. is secreted from the blood by the liver; some of it is temporarily stored in the gall-bladder (q.v.), while the remainder passes through the common B.-duct to the duodenum, the first part of the small intestine. B. in itself is not a digestive juice, but certain of its salts promote greater activity in the pancreatic juices, and aid in the absorption of fats and fatty acids. The production of B. is practically continuous, but is stimulated by the processes of digestion. If by any means it is prevented from entering the intestine, digestion may proceed without much disturbance to health. If, however, excess of B. in the liver leads to its being reabsorbed by the blood, the condition known as jaundice (q.v.) is produced: the tissues are

coloured yellowish by the B. pigments, and there is general derangement of the system. A *bilious attack* is only indirectly connected with B.; catarrh is set up by the ingestion of unsuitable or too abundant food, and sickness, headache, and giddiness result, with vomiting of food and bilious matter. Purified ox bile has been used as an aperient and antiseptic. The B. of oxen which have d. of rinderpest has been injected in cattle in S. Africa for the prevention of that disease, and the B. of serpents is looked upon as a partial antidote to their poisons.

Bilge, see **SHIPS AND SHIPBUILDING**.

Bilharziasis (**Bilharziosis**, or **Schistosomiasis**), disease common in tropical and subtropical countries where unsanitary conditions prevail. Different forms occur, but all are due to a genus of flat worms, *Bilharzia*, named after Bilharz, who first discovered a species in 1851, in Cairo, and named it *Distomum haematobium* (later *Schistosoma* or *Bilharzia haematobium*). Another species (*S. japonica*) was found in China and Japan early in the 20th cent. B. was so prevalent in Africa and Asia that the Colonial Office appointed a commission (1913) to investigate the disease. The investigation was interrupted by the outbreak of war in 1914, but the infection of troops in Egypt stimulated research, and Leiper and other workers were able to trace the life hist. of the *Schistosoma*. In water the eggs of the *Schistosoma* develop into minute free-swimming larvae which infect snails. The infection is specific; each species of *Schistosoma* parasitises a particular species of snail, in which it forms spores. These develop into other free-swimming forms, cercariae, which enter man either in drinking water or by getting on his skin during bathing, and boring their way in. They then bore through tissues until they reach the pelvic veins, where they remain until adult. The male coils round the female, and they migrate through the pelvic veins until they reach the wall of the bladder. This the female *S. haematobium* pierces, causing the symptom haematuria, and lays her eggs which are evacuated with the urine. (Cercariae can live for only 2 days, so water enclosed for this period may subsequently be used without danger of infection.) The eggs of *B. mansoni* are laid near the anus, and are expelled with the faeces. In the early stages B. may be cured by the injection of tartar emetic into the veins. A synthetic compound 'nilodin' has recently been tried, with promising results. The late stages of the disease are incurable. Recent research on the prevention of B. includes attempts to eliminate the snail, and to destroy cercariae by the addition of compounds such as chloramine to contaminated water. See R. T. Leiper, *Researches on Egyptian Bilharziasis*, 1918; A. H. Hall, 'Bilharziasis in Iraq' (*Journal of the Royal Army Medical Corps*, vol. xlv, 1925); Manson, *Tropical Diseases* (14th ed.), 1954.

Biliary Calculi, see **GALL-STONES**.

Bilmbi, see **AVERRHOA**.

Bilin, riv. in Burma. Its course lies

between the Salween and the Sittang, for more than 280 m. It enters the Gulf of Martaban. In the Second World War the inadequate Brit. defence force at Thaton fell back on the B. to escape piecemeal destruction at the hands of the Japanese on the Salween R. (Feb. 1942). After fierce and costly fighting the Brit. units fell back on the Sittang. See BURMA, SECOND WORLD WAR CAMPAIGNS IN.

Bilin, see **BILINA**.

Bilina (Ger. Bilin), Czechoslovak tn in the region of Ústí nad Labem (q.v.). It is a health resort, and has mineral springs the waters of which are exported. Pop. 8600.

Biliousness, popular name for a condition characterised by loss of appetite, headache, lassitude, coated tongue, nausea, and constipation. This chain of symptoms, though not exclusively belonging to biliary disorders, is associated with conditions in which the flow of bile is interfered with. B. is a symptom of catarrhal jaundice (see JAUNDICE).

Bill, or **Beak**, in natural hist., the term applied to the horny toothless jaws of birds. The foremost bones of the skull are elongated, and covered with a horny sheath or rhamphotheca; the same with the lower jaw, or mandible. No living birds have any teeth, but the earliest forms of birds, such as Archaeopteryx, undoubtedly possessed some. The Tertiary Period appears to be the time when birds ceased to have teeth; traces can still be found in certain species. The B. is not usually sensitive, though in some aquatic birds, and in the woodpecker, it is much more sensitive than usual. The chief uses of the B. of a bird are for dividing food, for fighting, preening, nest-building, etc. It varies in shape in different species of birds, its conformation being adapted to the nature of its food and habits. Among peculiar beaks may be noticed the raptorial beak of birds of prey, the fissirostral beak of swallows, etc., the tenuirostral beak of sunbirds, etc. See also **BIRDS**.

Bill-broker, name applied to one who deals with bills of exchange, receiving bills from merchants, foreign or other banks, etc., and disposing of them for the best terms, and receives a commission on the transaction. But now the B. usually buys bills outright and sells them to banks and other buyers. He is financed by the banks by loans at call and short notice. He acts as principal and not agent, and the name of broker (who does not buy and sell but acts as an intermediary between buyer and seller) does not strictly apply to him.

Bill Chamber was a dept of the Court of Session in Scotland which dealt with business of a summary nature, such as applications for interdict, etc. It was so called because in former times summonses and executions were generally begun by a writ, called a bill. It was abolished in 1933 and its functions transferred mainly to the Petition Dept.

Bill in Equity, or **Bill of Chancery**, formerly a statement in writing of a

plaintiff's case, setting forth the grounds on which he claimed relief. It is now an obsolete form of pleading, and its place is taken by a writ and statement of claim.

Bill of Adventure, in maritime law, a writing signed by a shipmaster, merchant, or owner, declaring that merchandise shipped in his name is 'at the venture' of another, and his responsibility is limited to their safe delivery.

Bill of Costs, itemised account setting forth in detail the work done and the charges and expenses paid by a solicitor on behalf of his client. By statute a solicitor must deliver a signed B. of C. to his client.

Bill of Exchange, form of credit instrument of practically universal commercial use, and governed by laws and regulations which, with certain differences, are identical in all countries. In the U.K. the law, founded on mercantile custom, judicial decisions, and separate statutes, was codified in the Bills of Exchange Act, 1882, which has been adopted by Brit. overseas dominions and colonies and agrees in the main with the law of the U.S.A. The original form from which the B. of E. developed was a simple system by which money could be paid in a distant place without sending cash; thus A living at X owes money to C living at Y; D, also living at Y, owes a debt to A; therefore A sends to C an order to D to pay the money to C; or suppose A sells to D goods on credit, but his business requires ready money; if he can get D's acknowledgment, and his credit is good, he can raise money now on D's promise to pay cash later for a consideration from a third party; thus arises the discounting of bills; D is going to pay A in 3 months, for goods shipped, £100; C will lend A the money now at 4 per cent; he therefore will give £99 and collect £100 from D when the time expires. Various forms of such means of transacting commercial business were no doubt in use in early times, but the B. of E., as a negotiable instrument, was evolved, it is said, by the Florentine Jews in the 13th cent., and was in use generally in commercial Europe by the 14th cent. There are 2 classes of bills: 'inland' bills, covering transactions in one country only, and 'foreign' bills, which are drawn in one country and payable in another. Bills may also be classified as good 'trade bills' where the transaction is based on produce or goods sold and coming into the market; such bills are said to pay themselves, and form the best kind of security for advances made on them; other bills, which are drawn on securities or on credit, are called 'finance' bills; lastly, there are 'accommodation' bills, or 'kites', where no valuable consideration passes between the parties to the bill. By the Bills of Exchange Act, sec. 3, a B. of E. is defined as 'an unconditional order in writing, addressed by one person to another, signed by the person giving it, requiring the person to whom it is addressed to pay on demand or at a fixed or determinable future time a certain sum in money to, or to the order of, a specified person, or to bearer.' Thus

a cheque (q.v.) is a B. of E. drawn on a bank payable on demand. (It may be noted here that bills payable on demand, i.e. cheques, must have a twopenny stamp on them; other bills must be stamped *ad valorem*; the rates can be found in any almanac, postal guide, etc.) An example of a simple inland B. of E. will elucidate the definition:

£100

LONDON, 1st Nov. 1958.

Three months after date pay to the order of Mr S. Robinson the sum of one hundred pounds, for value received.

SMITH & Co.

To Messrs JONES & Co., Glasgow.

The last words, 'for value received,' are not legally necessary, as the law presumes that the bill was given for valuable consideration. Here Smith & Co. are the 'drawers,' Jones & Co. the 'drawees,' who on signing their name across the front of the bill become 'acceptors.' Robinson is the 'payee.' By accepting the bill Jones & Co. become the persons primarily liable on the bill. The acceptor may qualify the bill by attaching conditions, e.g. delivery of bills of lading, or making it payable at a certain place, such as his bank. When the bill falls due, that is, on 1 Feb. 1959, with 3 days' grace, it is presented to the acceptors for payment; if it is not accepted or not met by payment at maturity the bill is 'dishonoured,' and the holder must give notice at once to the drawer and any other persons who have endorsed the bill, from whom he can then claim payment. If the bill is a 'foreign' bill it must be 'protested' by a notary public on the day of dishonour. A bill dishonoured by non-acceptance can be accepted by another 'for honour *supra protest*'; if by non-payment, it can be paid *supra protest*; the new acceptor or payee having rights against the party for whose honour he has accepted or paid. A B. of E. is a negotiable instrument, the property in which passes, like money, by delivery; if the bill is made payable to bearer; if payable to order then it must be endorsed. In the example given above, the bill is made payable to the order of S. Robinson; if he wishes to transfer the bill he writes his name on the back. An endorsement in blank makes the bill payable to bearer; a special endorsement makes it payable to a specially named person's order, who to transfer the bill must again endorse it, and so on. A bill can, and often does, pass through a number of hands before it is discharged by presentation to the acceptor and payment by him, and the greater part of the law relates to the rights and liabilities between the various parties through whom it has passed. The person to whom a negotiable instrument is transferred by endorsement or delivery can sue in his own name, and if he is a 'holder in due course' takes the bill free from all defects of title. To be a 'holder in due course' he must have given value for the bill, the bill must not be overdue or known to be dishonoured, and he must take the bill honestly and without notice of a defect

in title, such as fraud, etc. See M. D. Chalmers, *Digest of the Law of Bills of Exchange*, and Byles, *Bills of Exchange*; also J. A. Slater, *Bills, Cheques, and Notes* (for general readers).

Bill of Exchange, or Exchequer Bill, form of security on which the Brit. Gov. borrows money for the public service, under parl. authority. They were first issued in 1696. They used to be issued annually, and bore daily interest till 1861. They were current for 5 years, and renewable, and the rate of interest, fixed half-yearly, varied with the money market. They became extinct in 1897, and have been superseded by treasury bills, issued for a maximum period of 12 months, and exchequer bonds, issued for a specific period, and with a fixed rate of interest.

Bill of Health, document given to the master of a ship, when clearing from a port, by the consul or other port authority; it shows the sanitary condition and health of the port; where there is no infectious or contagious disease existing, it is a 'clean bill'; if disease is thought possible, it is a 'suspected' or 'touched'; if it actually exists, it is a 'foul bill.' B.s of H. are necessary when the next port of call is one where the ship may be quarantined if there be no clean bill.

Bill of Indictment, see INDICTMENT.

Bill of Lading, document signed by the master of a ship or an agent of the owner, acknowledging that goods have been received on board, and stating the terms on which they are to be carried. The B. of L. serves as a receipt for the goods shipped on board, as the memorandum of a contract between the owner of the ship and the shipper of the goods, and as a document of title to the goods; and if, as is usual, the goods are deliverable to the consignee's order or assigns, the B. of L. becomes a negotiable instrument, transferring by endorsement the rights to the goods and the various liabilities and rights of the contract. There are various forms of B.s of L., but they all contain the names of the shipper, of the ship, the port where the goods are loaded and the destination, the description of the goods, place of delivery, name of consignees, freight, the excepted perils, and shipowner's lien. With regard to the more important of these items, it should be noted that it is implied that there should be no deviation from the route of the voyage, and the shipowner is liable for loss or damage due to such deviation, except to save life (but not property). It is usual, however, to insert in the B. of L. specified 'liberties'; the quantities and condition of the goods at the time of shipment must be described, as the contract is to deliver that quantity in the same condition. A 'clean bill' is one where the goods are not described with qualifying words, such as 'cases one or three in damaged condition,' or the like. The contract is to deliver at a certain place; the shipowner is liable if he does not do so, unless his failure is due to one of the perils excepted, or, for example, war has closed the port. The B. of L. generally contains the name of

the consignee to whom the goods are to be delivered, and usually adds to his 'order or assigns.' He can then transfer his rights and liabilities to a third person by endorsing his name and delivering the document. The bill thus becomes a negotiable instrument, and can be re-endorsed. On payment of freight the endorsee receives delivery of the goods. The amount of freight is either stated in the B. of L., or reference is made to the terms of the charter-party. The 'excepted perils' are those causes of loss or damage which exempt the shipowner from liability. The common law exemptions are 'act of God,' i.e. every act in which man has no part, and the act of the 'king's enemies,' i.e. war. The shipowner is presumed to undertake absolutely that the ship is seaworthy, and that all reasonable care will be taken by his servants and agents. It may be noted that by Eng. law a shipowner may make any exceptions, but in the U.S.A. an Act of 1893 forbids the insertion of terms exempting the owner from liability for loss through his servants' negligence. Finally, the shipowner has a lien on the goods for freight by common law, and, by the terms of the B. of L., usually for demurrage. See Scrutton, *Charter Parties and Bills of Lading*, 1925, and T. G. Carver, *Carriage of Goods by Sea*, 1925.

Bill of Mortality, weekly statement, formerly issued by the par. clerks, showing the number of deaths (and the causes) that had occurred in each par. based on the reports of 'searchers.' They are said to date from 1538, when par. registers were estab. They were regularised in 1603, and continued till the Births and Deaths Registration Act, 1836, was passed. The age of the persons dying was not inserted till 1728, from which year dates the science of life insurance.

Bill of Rights, name commonly given to the Act declaring the rights and liberties of the subject, and settling the succession of the crown, 1689, which embodied the Declaration of Right drawn up by a committee of the Commons and presented to William, Prince of Orange, and his wife, afterwards William III and Queen Mary. The B. of R. is the nearest approach to a written constitution which the U.K. possesses. Its provisions, so far as applicable, were embodied in the U.S.A. constitution.

Bill of Sale, form of legal document by which the grantor transfers to another (the grantee) the ownership, while retaining the actual possession, of personal chattels, such as goods, furniture, and other articles capable of transfer by delivery, including fixtures and growing crops, when assigned and charged separately from the building or land to which they are attached. The law on B.s of S. is to be found chiefly in the prin. Act of 1878 and the amending Act of 1882. The objects of these Acts are widely different. The enactments prior to 1882 were designed to protect creditors and to prevent their rights being affected by secret assurances of goods which were permitted to remain in the ostensible possession of a

person who had parted with the property in them. The B.s of S. were therefore made void only as against creditors or their representatives, but as between the parties to them they were perfectly valid. The Act of 1882 was designed for the altogether different purpose of preventing needy persons being induced to sign complicated documents which they might be unable to understand, and being subjected by their creditors to the enforcement of harsh and unreasonable terms; hence, a form was presented to which the B.s of S. were to conform. B.s of S. may be *absolute*, where the chattels are sold absolutely; they must be attested by a solicitor; the regulations as to such B.s of S. are laid down in the Bills of Sale Act, 1878; non-compliance does not void the B. of S. as between the parties, but only as against the trustee in bankruptcy and execution creditors of the grantor. More important are the second class, B.s of S. *by way of security for the payment of money*; they must be made in accordance with the form given in the Bills of Sale Act, 1882, which can only be departed from in verbal differences. The bill must be by deed, must contain the names and addresses of the borrower and the lender of the money for which it is security, the amount lent, and the interest; the assignment as security of the chattels, of which an inventory must be attached; the time when the money lent, and interest, will be repaid; a covenant to insure goods and pay all rent, rates, and taxes due on the premises where they are. The lender stipulates that the goods will not be seized except for the reasons set out in section 7, viz.: (1) default in payment and covenants; (2) bankruptcy or distraint for rates, rent, or taxes; (3) fraudulent removal of the goods; (4) unreasonable refusal to produce last receipts for rates, etc.; (5) execution under a judgment. A B. of S. must be witnessed and stamped in accordance with the scale, and registered within 7 days of its execution. As trade protection societies pub. all such registrations, a B. of S. damages a grantor's credit. All B.s of S. not complying with the regulations of the Act are void. There are no B.s of S. in Scotland. See H. Reed, *Bills of Sale Acts* (14th ed.), 1926, and Pitman's *Bankruptcy and Bills of Sale* (ed. W. V. Ball), 1921.

Bill of Sight, document given by an importer of goods to a customs officer, containing as good a description as possible of the goods, when a full description cannot be given. The goods can then be landed, but the full description must be given within 3 days.

Bill of Store, permit granted by the customs house to reimport Brit. goods without payment of duty such as would have been imposed had they been foreign goods. It must be within 5 years of exportation.

Bill of Victualling, or Victualling Bill, order to the master of a vessel by a custom-house officer for the withdrawal from bond or for drawback of such stores as are necessary for the crew and passengers. Stores not on the bill, or landed

in the U.K. without authority, are liable to be forfeited and destroyed.

Billancourt, see BOULOGNE-BILLANCOURT.

Billardiera, or **Appleberry**, genus of Australian evergreen climbers, family Pittosporaceae. Some species, such as *B. scandens*, are cultivated in Eng. glasshouses, bearing a fruit which, when ripe, is generally bluish in colour, and possesses a strong resinous flavour. The Tasmanian *B. longiflora* is grown out of doors in the mildest parts for the decorative value of its fruits.

Billaud-Varenne, Jean-Nicolas (1756-1819), Fr. revolutionary, the son of a lawyer, b. La Rochelle. His early home influences were bad, his parents being both of weak character. He joined a religious society when he was 19, but subsequently left it. In 1785 he went to Paris, and shortly afterwards married and became an advocate in the parlement. Political matters soon absorbed all his attention, and in 1789 he pub. a 3-vol. work on the subject, *Despotisme des ministres de la France*. This estab. his reputation as a prominent revolutionary. A leading member of the Jacobin Club, he was a close associate of Danton and Robespierre (qq.v.) and worked hard for the abolition of monarchy. When the trial of Louis XVI took place, he voted for 'death within twenty-four hours.' He was prominent in the overthrow of the Girondists in 1795, and in the same year he was made president of the Convention and member of the Committee of Public Safety. Later he helped to overthrow Robespierre, but soon after this he was himself arrested and banished to Fr. Guiana. He refused the pardon offered him by Bonaparte and d. in Haiti.

Billbergia, genus of perennial plants, family Bromeliaceae. They are chiefly found in Brazil and Mexico, and have stiff channelled leaves and tubular flowers of various colours. *B. nutans* and *B. portiana* make fine greenhouse plants.

Bille, Steen Andersen (1797-1883), Dan. admiral. He served in the Fr. marine during the campaign of 1823, was made rear-admiral and minister of the marine in Denmark, commanded an expedition round the world, and wrote an account of it.

Billerica, tn of Essex, England, 5 m. E. of Brentwood. Its old church has a tower which is considered one of the finest examples of brick architecture extant. B. is part of Basildon (q.v.) urb. dist. Pop. 9000.

Billet, in Romanesque architecture, an ornamental moulding formed of short cylindrical blocks, suggesting miniature wooden 'billets,' and set in a concave moulding.

Billet, in heraldry, a bearing of the shape of a rectangle placed on end. Although B.s are common in armorial bearings, their representation is uncertain. Some suppose them to represent bricks or blocks of wood. 'Billety' signifies that the charge is uniformly covered with B.s. See also HERALDRY.

Billeting, or **Cantoning**, as it is also

called, means of lodging officers and soldiers among the inhab. of a dist. The system of B. has been in vogue from the earliest times, when the monasteries afforded hospitality to soldiers. Natural and cordial resentment has invariably been aroused by these arbitrary proceedings, and the third article of the Petition of Right, passed in 1628, bound the king 'not to billet soldiers on private individuals.' Since the Army Act of 1881 B. is limited to the extent that only public-house proprietors, inn- and hotel-keepers are liable to have soldiers quartered on them, and keepers of livery stables to tend their horses. If the keeper of the house is unable to provide room, he is obliged to obtain accommodation in the vicinity. In 1909 'public buildings, dwelling-houses, warehouses, barns, and stables' were included in the official list of possible billets, but this extension was limited to times of emergency. During the 2 world wars B. became an obvious necessity, both in home tns near the training centres and also in the tns and vils. in the war area. The amount which is to be refunded to a householder to defray the cost of feeding one or more soldiers is laid down in army regulations. B., however, may consist only of board without food, and in this event no compensation is allowed. The householder is compelled to afford shelter, but not necessarily to supply beds.

Billfish, see BONY PIKE.

Billiards (probably from O.F. *billard*, stick with a curved end), an indoor game of skill. It is not definitely known whether B. originated in France or England, and it is more than doubtful if the game seen by Anacharsis in his travels through Greece in 400 so really had any analogy to even the most primitive form of the modern pastime. Among Eng. writers it is mentioned by Spenser in *Mother Hubbard's Tale*, 1591, and Shakespeare in *Antony and Cleopatra*, 1607. Ben Jonson draws a simile from the game in praise of Chloris; Looke uses it to illustrate a passage in his famous *Essay Concerning Human Understanding*; Gayton in his notes to the 1654 ed. of *Don Quixote* refers to B. as being played in taverns; and Charles Cotton in *The Compleat Gamester*, 1674, states that in England 'there are few towns of note . . . which hath not a public billiard table,' and proceeds to a description of the game and the rules then in force. Louis XIV was an enthusiastic player, and in Louis XV's time the game had become popular with both the male and female members of the Fr. court. Early in the 19th cent. the introduction of the cue (a flat-headed mace had previously been used), to which later a leathern tip was affixed, and the use of chalk which made possible the use of 'side,' that is, striking the cue ball on its right or left side, midway between its centre and edge, to impart lateral deviation, caused a revolution in the science of B. These were followed some years after by the substitution of slate beds for the former ones of oak and marble; and in 1835 indiarubber cushions for those of

flock and list; these were later improved by being constructed of a composition manuf. for the purpose, which is impervious to variations in temp. Under these conditions professionals like John Roberts, jun., Cook, Peall, Diggle, Reece, Dawson, Stevenson, Inman, and also the subsequent champions, T. Newman, J. Davis, W. Smith, C. McConachy, and W. Lindrum, brought the game to such a pitch of accuracy that the B. authorities have had to impose, from time to time, restrictions on certain strokes, to prevent their repetition from destroying the spectacular element in the game. Up to 1919 B. was governed by the B. Association (founded 1885) and by the B. Control Club (founded 1908), but there was confusion between the rules formulated by each body. In 1919 an amalgamation took place under the title of the B. Association and Control Council, with the Earl of Lonsdale as president. Since that time a great number of associations in all parts of the world have become affiliated to the Control Council. The first business of the council was to draw up a single code of rules, which has remained in force with only 2 revisions. In 1926 the council introduced a rule limiting consecutive hazards to 25 in order to prevent undue exploitation of the red-ball game. In the 1926 championship Reece first discovered the 'pendulum' stroke, and he was able to run up a record break of 1151, made mostly from 568 consecutive cannons. To avoid the future exploitation of the cannon sequence, an amendment to the rules was made limiting consecutive direct cannons to 35. A direct cannon is defined as being any cannon other than that made by the cue ball striking the cushion after making contact with the first ball, and before making contact with the second. One of the most popular moves of the Control Council was to institute a Brit. Empire amateur B. championship in 1926. In 1929 interest in B. centred on C. McConachy, New Zealand champion, and the brothers Lindrum, who came on a tour of England. They were, however, not allowed to enter for the Eng. championship, but with the exception of F. Lindrum, the Australian champion, who was indisposed in England, they gave some remarkable performances. W. Lindrum scored 32 four-figure breaks during the tour, one being the record break of 3262. In 1932 he estab. a new record with a break of 4137. In 1933 he met Joe Davis, the Eng. champion, for the world title, defeating him by 21,815 points to 21,121. He repeated the feat in 1934, when he won by 23,553 to 22,678. After 1934 he never visited England again, to the disappointment of Eng. enthusiasts, for he remains, by common consent, the greatest billiard player in the hist. of the game. The world title was not again contested till 1951, when C. McConachy (New Zealand) beat J. Barrie (England) in London by 9,294 to 6,691 points. No contest has taken place since. Davis maintained his position as Eng. champion, defeating Newman in 1938 and again in

1939, with a walk-over in 1946. In that year he retired from championship play of any kind.

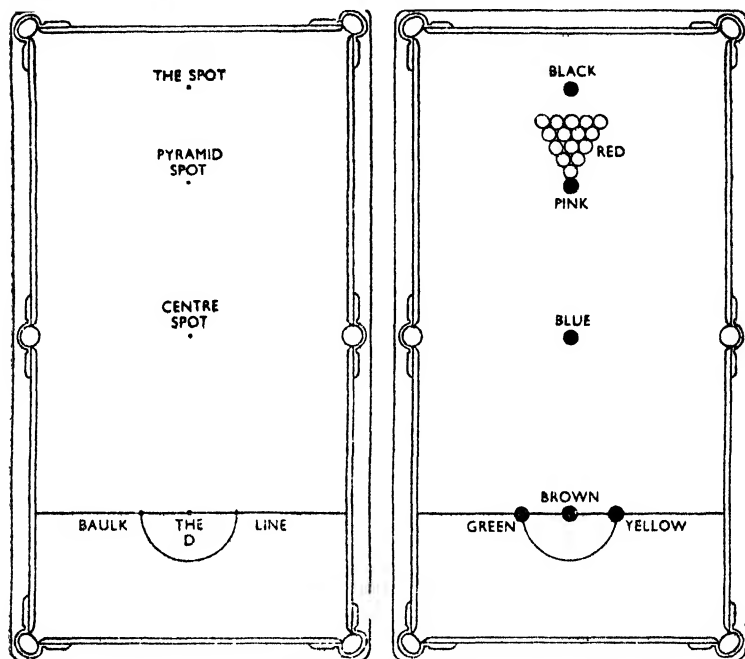
B. proper is divided into 2 distinct kinds: the Eng. game, as played, on a table with 6 pockets, in Great Britain and in most of the Commonwealth countries; and the Fr. form, played, on a pocketless table, in the prin. European cities and in America.

English billiards. The table consists of a mahogany or other hard wood frame standing upon 8 legs sufficiently strong to support the massive weight of 5 slate slabs each measuring 2 ft by 6 ft 1½ in., which, when proved by the aid of a spirit-level to be absolutely true all over, are covered with a green cloth of fine texture, and form the bed, at a height of 2 ft 9½ in. to 2 ft 10½ in. from the floor. The playing surface is bounded by cushions, covered with the same material, with openings at each corner and in the centre of its 2 sides (making 6 in all) to allow of the balls dropping into the hanging pockets. The surface of the table is marked out as follows: a baulk line is drawn 29 in. from the face of the bottom cushion and parallel to it; the intervening space being termed the baulk. A semicircle, called the D, is described in baulk, striking from the baulk line with a radius of 11½ in. Spots, of black court plaster, are placed (on an imaginary line down the centre of the table) at 12½ in. from the face of the top cushion (the spot), another half way between the middle pockets (centre spot), and a third, the pyramid spot, midway between the centre spot and the top cushion. Also spots are commonly placed on the baulk line, at its exact centre, and at the intersecting ends of the D. Cues are made of old and seasoned wood, ash being generally used. They vary in weight from 14 oz. to 18 oz. or more. The striking end, on which is the leather tip, is from ¾ to 1 in. in diameter. The average length is about 4 ft 10 in., but it varies according to the build and fancy of the user. The butt end is about 1½ in. in diameter and is often spliced with some heavier wood to give balance. Three balls are used, a red and 2 white, one of the latter being distinguished by 2 spots at opposite extremities for easy identification throughout a game; hence one player is 'spot' and the other 'plain.' They should measure 2½ in. to 2⅝ in. in diameter, and nowadays are made from compositions known respectively as bone-zoline and crystalate. Formerly ivory balls were used, but were superseded in the late 20's. Two other implements are sometimes in requisition, the half-butt and the butt, for playing a ball when at an inconvenient distance from the striker. Points are scored either by the cannon, the cue (striker's) ball touching both object balls in its course, or by the losing and winning hazard.

The losing hazard is made by the cue ball striking one of the object balls and going off into a pocket; the winning hazard consists in pocketing one of the object balls by striking the cue ball against it. The cannon counts 2; going

in off, or pocketing, the white ball, 2; the red, 3. It is also possible to make combinations of these scores from one shot. Friendly games between good amateurs may be of 250, 500, or more 'up.' In championships sessions of 2 hours are played. The amateur championship final consists of 6 sessions (3 days). A game is most frequently contested by 2 persons, but 4 sometimes

in the order indicated. Pyramids consists of 15 red balls placed at the top end of the table in the form of a triangle, and is played by 2 players using the same white cue ball alternately. He who pots the most balls wins the game. It is usual to receive so much for each ball potted, double on the last one, and a stake on the game. When more than 2 persons compete it is designated 'shell-out.' Other



THE BILLIARD TABLE

Left, spots and markings for billiards; right, arrangement of balls for snooker.

play. A player continues until he fails to score, when he makes way for his opponent, and his 'break' is ended.

English pool and pyramids. The ordinary pool game consists of 3 or more players, each playing with a different coloured ball in the following order: white, red, yellow, green, brown, blue, pink, spot-white, spot-red, spot-yellow, spot-green, and spot-brown. Each participant in the pool endeavours to 'pot' or pocket his opponent's ball, the one 'potted' losing a 'life' which usually possesses a monetary value, generally one-third that of the entrance to the pool. The game is commenced by a white going on the top spot, red playing upon it from baulk, the others playing upon each ot' r

varieties of pool are Snooker, Russian, Black, Skittle, Pin, Cork, and Indian Pool. Russian and Indian Pool are the only Eng. varieties into which cannon play enters.

Snooker is played by 2 players, or 4 players in 2 partnerships, with 15 red and 6 coloured balls and the striking ball, white. The red is first potted, and this entitles the player to pot any coloured ball, which is returned to its specific spot on the table. Potted reds stay down, i.e. in the pocket(s). This procedure is followed, red and coloured alternately, until all reds are potted, leaving on the table only the coloured balls which are then potted in the following order, and with the scoring values shown: yellow (2),

green (3), brown (4), blue (5), pink (6), black (7). The same values count for colours potted in the first part of the game, reds gaining 1 point each. The word 'snooker,' applies to the act of 'laying a snooker,' an integral feature of the game. A player is said to be snookered with regard to any ball when a direct stroke to the ball he should play at is obstructed by one which he should avoid. An amateur championship of snooker was inaugurated by the B. Association in 1916 and a professional championship by the Control Council in 1927. The rules of snooker were revised in 1920 and again in 1926.

French and American billiards. This form of B. is played upon a pocketless table, 9 ft by 4½ ft, or for championship games 10 ft by 5 ft, and is confined strictly to cannon-play, or, as it is usually termed, carom, from the Fr. name, *carambolage*. Three balls are used, 1 red and 2 white, which are larger and heavier than those used in Eng. B., and the cues more powerful. The somewhat coarser nap of the cloth causes the balls to run more slowly, and since they are larger and heavier more 'work' can be got upon them. Every type of game played on the pocketless table is commenced by placing the red ball upon a spot near the top cushion, and the 2 whites occupy parallel positions at stated points spotted within the lower half. The cue ball, in opening a game, must be played at the red, the endeavour of the striker being to bring the balls together so as to control them in a sequence of cannons. Each cannon counts 1, and the player continues his break until he fails to score. The proficiency acquired by professionals like Vignaux on the Continent and Slosson and Frank Ives in America caused the authorities controlling Fr. B., especially in America, to devise restrictions in order to keep down the enormous sequences of cannons. Thus the game has become divided into 3 varieties: the plain cannon game, the corners lined off and the push stroke barred, and the baulk-line game, which latter can be varied according to the fancy of the players. An offshoot of the game proper is the three-cushion-cannon type, the cue ball having to strike 3 or more cushions before it can cannon on to the second object ball.

American pool. Amer. or 15-ball pool is played upon the ordinary 6-pocket table, and the 15 balls, each bearing a number, are set after the manner in Eng. pyramids; a deep red ball (the one marked with the highest number—15) is placed upon the pyramid spot and forms the apex of the triangle pointing towards the baulk end of the table. The player endeavours to pocket as many of the object balls as possible with the white cue ball. The figures marked on each ball count towards the score, so it is a most important point to know the exact situation of the balls bearing the highest numbers. The player with the highest aggregate, after the last ball is potted, wins. Another form of this game is known as Continuous Pool—the one who first reaches 100 being the winner. Each time the whole of the

balls are potted they are reset upon the table as for a fresh game, and play continues until one of the participants has scored the desired 100. Other varieties played in the U.S.A. are Chicago and Bottle Pool.

Leading professional exponents of snooker to-day are Joe and Fred Davis, W. Donaldson, H. Lindrum, S. Smith, J. Pulman, J. Rea, R. Williams, K. Kennerley, Alec Brown, and Albert Brown. J. Davis has compiled 670 breaks of 100 or over.

The amateur standard at snooker has improved immensely since the war, and the difference between the amateur's play and that of the professional is one of degree and not of kind, as formerly. The skill of professional play, and in its turn of amateur snooker, is the result of the intensive study of the game made by Joe Davis prior to and after the last world war. See J. P. Mannock, *Billiards Expounded*, 1904; Riso Levi, *Strokes of the Game* (3 vols.), 1920; A. F. Peall, *All about Billiards*, 1925; Joe Davis, *Billiards up to Date*, 1928, *How I play Snooker*, 1950, and *Advanced Snooker*, 1954.

Billingham, urb. dist. of Durham, England, on the N. bank of the mouth of the R. Tees. B. has grown from a small vil. to a tn in 30 years. Partly agric, but principally industrial, it contains large chemical works, shipyards, and other metal and engineering works. Pop. 24,000.

Billings, Josh, see SHAW, HENRY WHEELER.

Billings, city, cap. of Yellowstone co., Montana, U.S.A., on the N. Pacific railroad. The third largest city in the state, it is the trade and shipping point of wool, live-stock, alfalfa, and dairy products, beet, sugar, flour, meat products, and vegetables. It has an oil refinery and manufs. electrical equipment and farm machinery. The E. Montana College of Education and Rocky Mt. College are here, and there is also an airport. Pop. 31,834.

Billingsgate, prin. fish market in London, situated just E. of London Bridge. It is the most anct market belonging to the Corporation of London. The original site was one of the two gates in the Rom. wall along the riv., and the name appears to derive from a person. Here was one of the havens where royal tolls and customs were collected as early as the reign of Ethelred (979-1016), and probably earlier. It became a general market for corn, wine, salt, fish, pottery, coal, etc., and apparently did not become mainly a fish market until some time in the 16th cent. (the main fish market for cents. had been at Queenhithe and Fish Wharf). In 1699 an Act of Parliament estab. it as a free and open fish market. The present building was completed in 1876. B. as a synonym for vituperative language goes back at least 400 years.

Billington (née Weichsel), Elizabeth (c. 1765-1818), Eng. singer, b. in London. She was the daughter of a Ger. musician, from whom she received her first musical

training. She was a child of 8 when she made her first appearance as a pianist at the Haymarket Theatre. Her singing career began when she was 17, and in 1783 she secretly married her singing-master, a Mr B. The couple went to live in Dublin, and it was there that she made her debut in opera. In 1786 she returned to London and accepted an engagement at Covent Garden, at a salary unheard of at that time. She was reigning favourite in London (1786-94), and on the Continent (1794-6), and in London again (1796-1811).

Billion Dollar Congress, the 51st Congress of the U.S.A., which came into power immediately after the passing of the McKinley Tariff Act of 1890 and was popularly so called because it appropriated roughly a total amount of a billion (thousand million) dollars during its 2 sessions to meet the excessive increase in national expenditure consequent on Republican legislation.

Biliton, **Beltung**, or **Belitoeng**, Indonesian is. situated between Borneo and Banca. It is about 5 m. long, 44 m. broad, and in area 1800 sq. m. Its coast is fringed with coral reefs and rocks, which render it difficult of access. It is marshy and sandy, but the interior is somewhat hilly, being at an altitude of nearly 3000 ft. The is. is noted for its tin mines. The exports are rice, sago, nuts, gum, tortoise-shell, etc. The port of Tanjung-pandan is the chief tn. Pop. 75,000, of whom a quarter are Chinese immigrants.

Billon, Ger. coin-alloy of copper and silver in which the base metal greatly predominates. Usually one part of gold or silver to three of copper.

Billot, Jean Baptiste (1828-1907), Fr. general. He served with great distinction in Algeria until he was recalled to take command of the 18th Corps d'Armée on the outbreak of the Franco-Prussian war. He was elected a life senator in 1875, and was minister of war in the de Freycinet Cabinet.

Billroth, Christian Albert Theodor (1829-94), Ger. surgeon, b. Ruegen. He studied medicine and graduated at Berlin, 1852. In 1860 he became prof. of surgery at Zurich, and 7 years later at Vienna, where he did his best work. He was a pioneer in the surgery of the stomach and intestines and an advocate of Lister's antiseptic method. He made valuable contributions to the study of wound infection. During the Franco-German war he served voluntarily with military hospitals and his work there, together with a famous speech on the war budget, was instrumental in securing sev. reforms in the transport and treatment of the wounded. His book *Allgemeine chirurgische Pathologie und Therapie*, 1863, reached 11 editions and was trans. into 10 languages.

Bilma, oasis in Sahara on the route from Tripoli to Kuka. It is noted for its salt mines.

Bilney, Thomas (c. 1495-1531), Eng. heretical preacher, b. probably near Norwich. Educ. at Trinity College, Cambridge, he was ordained in 1519. He

preached against formalism, and the veneration of saints and relics. In 1527 he was tried by Wolsey as a heretic, and was imprisoned for a year in the Tower. He then resumed preaching, but was once more condemned, and sentenced to be burned at the stake in Norwich.

Biloculina, name given by d'Orbigny to a genus of minute protozoans of the family Milicididae and order Testacea. They are marine animals. B., in geology, are a genus of Foraminifera which are found in the tertiary deposits of the N. Sea.

Biloxi, city in Harrison co., Mississippi, U.S.A. It is on a branch line of the Louisville and Nashville railroad, and is a summer and winter resort for the residents of Mobile and New Orleans. It does a trade in packing and shipping fruit, vegetables, and oysters. Pop. 37,400.

Bilthorpe, agric. vil. of Notts, England, in Sherwood Forest, with waterworks for various parts of the co., now one of the new coal-mining vils. Pop. 2200.

Bilston, tn of Staffs, England, 4 m. from Wolverhampton, and is one of the iron-smelting centres. There are considerable manufs., which consist of heavy iron goods—bars, machinery, engines, bedsteads, iron and brass castings, wire, etc.—tin, enamelled goods, japanned ware, and pottery. A hard stone is found in the neighbourhood which is utilised for grindstones, and also a fine sand for casting, is obtained. Pop. 33,464.

Biltong, sun-dried salted meat; an Afrikaans (q.v.) word commonly used throughout S. and E. Africa. Formerly made entirely from game, but beef, mutton, and ostrich are now used. B. is valued for its nutritional and keeping qualities and lightness of weight.

Bima, seaport, and cap. of the is. of Sumbawa, Indonesia. The is. is especially renowned for its teak forests and tamarinds. The exports are timber and horses.

Bimbia, riv. of W. Africa, which enters the Bight of Biafra, to the W. of the Kamerun R. It is known in its upper course as the Mungo R.

Bimetallism, the employment of both silver and gold coins as standard money or legal tender, widely operated in the 19th cent. because of the fear that one metal alone would fail to satisfy the demand for money and so produce deflation. But it worked smoothly only as long as the ratio between the values at which the two metals could be freely minted into coins approximated to their relative values in international markets. Otherwise the metal with the higher international value would tend to be sent abroad and be replaced by the other. Hence the instability of the system, and the periodic but not always successful efforts to achieve international agreement on relative values. It was hoped that if all the commercially important countries agreed to fix the ratio of the value of gold and silver at 15½ to 1, it would be possible to maintain that ratio by regulating the demand, i.e. by increasing or decreasing the coinage of gold or silver, and so stimulating or discouraging supply. The

advantages claimed for a fixed ratio are greater stability in value of commodities generally, since there is likely to be a compensatory supply of one metal if the production of the other diminishes; the avoidance of depending on one metal, the supply of which may not be equal to the work required to be done; and the possibility of establishing a world currency, with consequent advantages to commerce universally. The great weakness of the case for B. was the conflicting interests of different countries in adjusting the supply of and the demand for the 2 metals. This is well illustrated by the conditions which led to the bimetallic controversy. Between 1848 and 1860 great discoveries of gold took place in California and Australia. France, America, and the prin. European countries except Britain had a double coinage standard, and gold was minted in large quantities, a large amount of silver being exported to India and other countries having a silver standard only. After 1870 the production of gold diminished, and that of silver increased enormously. The consequence was a general rush to mint silver and the operation of Gresham's law in causing the exportation of gold. An attempt to restrict the coinage of silver threw it on the market as metal, and caused a further fall in price. The Indian Gov., as large holders of silver, and the silver producers of America, thus suffered considerable loss. A great agitation now sprang up, chiefly in America, to bring about an international agreement to fix a ratio and make a double standard universal. Money conferences were held in Paris in 1878 and 1881, but without effect. Through the efforts of the U.S.A., another conference was held at Brussels in 1892, but the opposition of Britain and Germany again prevented the estab. of a silver standard. An attempt was then made in America to establish a bimetallic standard for that country independently of Europe, and the presidential elections of 1896 and 1900 were fought mainly on that issue. The Gold Standard Act of 1900, however, placed the country on a monometallic gold standard. By 1914 a gold standard was universal in all countries except China, which maintained a silver standard. The general adoption of gold dates back to the depreciation of silver after 1873. In this year Germany

the first half of the 19th cent., when B. was confined to France and a few other countries, a ratio of 1 to 15½ was maintained between gold and silver. This ratio successfully withstood the gold discoveries of 1850 and the increased ann. output, but Germany's demand for fifty millions in gold after the Franco-Prussian war decided the fate of B. At the Genoa Conference in April 1922 it was decided that all countries must stabilise their currencies on a gold basis. The idea of B. was revived during the economic crisis of 1931-2. Its introduction would greatly increase the value of silver; but the idea was not seriously entertained. Shortage of the precious metals was not feared, as paper currencies spread when the Gold Standard broke down in the 1930's. The bimetallic controversy may be studied from the point of view of the bimetalist in *International Bimetallism*, 1896, by F. A. Walker; the opposing side is represented by Giffen in *The Case against Bimetallism*, 1892; whilst an impartial view is adopted by Leonard Darwin in *Bimetallism*, 1897. See also W. S. Jevons, *Investigations in Currency and Finance*, 1884, and D. Barbour, *Theory of Bimetallism*, 1885.

Binan, or Vinan, tn of Laguna prov., Luzon, Philippine Is., on Laguna de Bay. It grows coconuts, rice, and sugar. Pop. 20,794.

Binary Theory, generalisation in chem. which is now of historical interest only. It assumed that every chemical compound consisted of 2 parts which might be elements, or groups acting as elements, 1 element or group being electro-positive and the other electro-negative. The theory has been discarded.

Binehe, industrial tn in the prov. of Hainaut, Belgium, 10 m. ESE. of Mons. Pop. 10,100.

Bink, or Bink, Jacob (c. 1500-c. 1568), Ger. painter and engraver, b. Cologne. He studied under Dürer and worked in Denmark. His engraving is unequal; among his best productions may be named the 'Divinities of the Fable' and his various portraits.

Bindusara (297-272 BC), 2nd Mauryan Emperor of India; son of the conqueror Chandragupta, and father of Asoka, who succeeded him.

Bindweed, name given to sev. plants of the family Convolvulaceae, which climb by means of twining stems and are natives of Britain. The name is most often applied to the sweet-scented *Convolvulus arvensis*, or Cornbine. The larger B. or Bellbine is *Calystegia sepium*, a perennial of the hedges; and the Sea B. is *Calystegia soldanella*, found on sandy or shingly shores. The name black B. is given to *Polygonum convolvulus*, an ann. species of Polygonaceae.

Binet-Simon Test, method of testing the intelligence of persons by putting to them a series of questions and getting them to perform a number of simple exercises, such as drawing, which can normally be performed by children of various ages. The test is named after Alfred Binet (1857-1911), Fr. psychologist, director of the

countries of the Lat. Union that they suspended the free coinage of silver in order to protect their stock of gold. They were thus forced into a regime of incomplete or 'limping' B., which hardly differs in practice from the monometallic gold standard. The 2 systems could not exist side by side, for the bimetallic country lost alternately the metal, of which the monometallic countries were most in need, and received in exchange the unwanted metal. The theoretic bimetallics had hoped for an international agreement establishing the free coinage of both gold and silver in all civilised countries. In

laboratory of psychology at the Sorbonne, and his collaborator Dr Simon. Originally designed to detect mental deficiency, the test was found to be useful to detect differences of intelligence at all except very high levels of ability. This test is now rarely used in its original form, the revision by Terman at Leland Stanford Univ., called the Revised Stanford (1937), being generally preferred. See INTELLIGENCE TESTS.

• **Bingen**, Ger. tn in the Land of Rhineland-Palatinate (q.v.), on the Rhine (q.v.), 17 m. W. of Mainz (q.v.). Behind the tn is the *Rochsburg* on which is a chapel with fine sculptures and paintings. Near by is the *Bingerloch*, a whirlpool most dangerous to navigate until the channel was widened in 1834. The *Mauseurturm* (Mouse tower) is situated on a rock in mid-stream, the scene of the legend of Bishop Hatto II (q.v.) related in Southey's ballad. B. is a tourist centre, and has an ancient wine trade. Pop. 17,000.

Binger, Louis Gustav, Fr. officer and explorer, b. Straesburg in 1856. He studied the language of the Bambara in the Niger states, and pub. a work on the Niger. In 1887 he commenced his expedition from Senegal up to the Niger, and 2 years later he arrived at Grand Bassam. He described this journey in his work *Du Niger au golfe de Guinée par le pays de Kong et le Mossi*, pub. in 1891. In 1892 he again visited the Guinea Coast for the purpose of superintending the forming of the Eng. and Fr. boundaries. Appointed governor of the Ivory Coast, 1893. See Henri Mouézy, *Asinie et le royaume de Krinjabo* (Paris), 1942.



BINDWEED

Bingerville, tn of W. Central Africa, situated a little to the NW. of Grand Bassam. Named after Louis Binger (q.v.).

Bingham, Joseph (1668-1732), divine, b. Wakefield, Yorks. He was educ. at Oxford, and was made fellow of his college in 1689, and tutor in 1691. After

some time he was forced to resign his fellowship, and leave the univ. because of an accusation brought against him of heresy. This originated from a sermon which he preached upon the terms 'Person' and 'Substance' as applied to the Trinity. Shortly after, a living was given him at Headborough, close to Winchester, and it was here that he wrote his great work, entitled *Origines Ecclesiasticae, or Antiquities of the Christian Church*, in 10 vols., 1708-22.

Bingham, small tn of Notts, England, 8 m. from Nottingham. Pop. 1800.

Bingley, urb. dist. and mkt tn in W. Riding, Yorks, England, on the Aire, 6 m. from Bradford. Its manufs. are woollen goods, worsted, cotton, paper; there are extensive iron works in the neighbourhood. It possesses sev. fine buildings; among them are technical schools, a free library, a hospital, etc. Pop. 21,566.

Bingo, see DOMINOES.

Binh-Dinh, tn of S. Annam (q.v.), 11 m. from the coast and 205 m. S.E. of Hue (q.v.). It is a centre of silk production and cloth weaving, and its port is Qui-nhon.

Binh Xuyen, brigand group in Cochinchina (q.v.) led by Le Van Vien. This group maintained an army and controlled a strip of territory adjoining Cholon (q.v.). It derived a large income from levying 'protection money' from Cholon business men and by organising gambling and other vice in Cholon. In time it became a political force having its representatives in the gov. and, in 1954, assuming responsibility for Viet Nam's (q.v.) security services. Removed from the gov. by President Ngo Dinh Diem (q.v.), the Binh Xuyen clashed with the national army and was finally defeated and disbanded in 1955. Le Van Vien now lives in France. See E. Hammer, *The Struggle for Indo-China*, 1954, and the supplement, *The Struggle for Indo-China Continues*, 1955.

Bink, Jacob, see BINCK.

Binnale, tn in the prov. of Pangasinan, Luzon, Philippine Is., E. of Lingayen. It produces copra, corn, and rice. Pop. 26,501.

Binnacle, framework or case or box in which is kept the nautical compass. It is fitted with lighting apparatus, so that the compass can be seen at night. It is as a rule placed on the deck of a ship, in front of the steersman. A double B. is occasionally carried, one on each side of the steering wheel. On board a man-of-war, one B. is for the use of the officer on watch, while the man at the wheel has the other. At one time the B. was just a locker with sev. compartments, to contain the compass lights, watch-glasses, etc. In the middle div. was placed the small lamp, and as the sides were of glass a light could be thrown on the compass all the time at night. The modern B. has been improved, for it is so constructed that the compass needle is made proof against vibration or shocks.

Binney, Edward William (1812-81), geologist, b. Morton, Notts. He practised as a lawyer, and became expert on the

geology of Manchester coal-fields. He was concerned with the founding of Manchester Geological Society, of which he became president twice (1857-9; 1865-7). F.R.S. 1853.

Binnie, Sir Alexander Richardson (1839-1917) engineer, b. London, educ. at private schools and under J. F. Bateman, F.R.S., president of the Institute of Civil Engineers; was engaged on Welsh railways, 1862-6; in Indian Public Works Dept, 1868-74; was appointed engineer to the city of Bradford, 1875; and chief engineer to the L.C.C., 1890-1901; his engineering feats include the Blackwall Tunnel, Bradford Waterworks, and Barking Road Bridge.

Binocular, see VISION.

Binoculus, term formerly used instead of *Apus* for a genus of phyllopodous crustacea of the family Apodidae. They inhabit fresh-water ditches, pools, and stagnant waters, and are gregarious. Males are seldom produced; the females carry their eggs about on specially modified appendages, and these eggs preserve the living principle for a long time in a dry state.

Binomial (Lat. *bis*, twice; *nomen*, a name), the name given in algebra to an expression consisting of 2 terms, as $a+b$, $a-b$. The *binomial theorem* is a method of expanding any power of a B. expression into a series. It is given in the following formula, where n may be any power integral or fractional, positive or negative.

$$(x+y)^n = x^n + nx^{n-1}y + \frac{n(n-1)}{1.2}x^{n-2}y^2 + \frac{n(n-1)(n-2)}{1.2.3}x^{n-3}y^3 + \dots + y^n.$$

Thus, the expansion of

$$(x+y)^5 = x^5 + 5x^4y + \frac{5.4}{1.2}x^3y^2 + \frac{5.4.3}{1.2.3}x^2y^3 + \frac{5.4.3.2}{1.2.3.4}xy^4 + \frac{5.4.3.2.1}{1.2.3.4.5}y^5$$

$$10x^2y^3 + 10x^3y^2 + 5xy^4 + y^5.$$

The theorem owes its origin to Sir Isaac Newton, who first pub. it in 1676.

Bintan, chief is. of the Riouw archipelago, Indonesia. It is situated on the S. of the strait of Singapore. The coast is beset with rocks and small is., while the interior is low and marshy. Pepper, gambler, rubber, and rice are exported. There is also a trade in timber and tin. The chief port is Tanjongpinang. Pop. 18,500.

Binturong, or 'black bear cat' (*Arctictis binturong*), small black carnivorous mammal, found in India, Sumatra, Java, etc. It possesses a large head, and a thick long tail, prehensile at the tip. Its habits are nocturnal and solitary, slow and crouching. It feeds upon birds and insects. Its howl is very loud. It is easily tamed.

Binyon, Laurence (1869-1943), poet and orientalist, b. Lancaster, son of a clergyman. He was educ. at St Paul's School and Trinity College, Oxford, where he won the Newdigate Prize for Poetry. In 1898 he joined the staff of the Brit. Museum, and from 1913 to 1933 was

Keeper of the Oriental Prints and Drawings. His first book of verse was *Lyric Poems*, 1894, and just after the First World War he pub. *The Four Years*, containing the well-known poem 'For the Fallen' which has been quoted innumerable times in war memorial services. In 1924 he compiled *The Golden Treasury of Modern Lyrics*, and he also added a fifth book to Palgrave's famous anthology. His last vol. of verse was *The Burning of the Leaves*, 1944. He also trans. Dante's *Inferno* into Eng. verse, 1933, and pub. sev. plays. He was widely celebrated as an authority on oriental art. He compiled official catalogues of the Jap. colour prints in the Brit. Museum, as well as of Eng. drawings, and during his 20 years in charge of the oriental dept he made it the most representative in Europe. His books on art include *Painting in the Far East*, 1908, *Court Painters of the Grand Mogul*, 1921, *Drawings and Engravings of W. Blake*, 1922, and *English Water Colours*, 1933. In 1932 he was created a Companion of Honour.

Biobio, one of the largest rivs. in Chilo, S. America. It is 240 m. long. Its source is in the volcano of Antuco, on the Argentine border, and it takes a NW. direction to Concepción, a port on the Pacific coast. It is more than 2 m. wide at its mouth, but is navigable only for shallow boats above Concepción. B. is also the name of a prov. of S. Chile. It has an area of 4343 sq. m., and is divided into 3 depts. The chief products are timber and agric. products. The cap. is Los Angeles. Pop. 129,300.

Biochemistry is that section of chem. which investigates the chemical changes and products evolved in the life processes of plants and animals. It includes the investigation of the nature of living matter and the chemical processes of life and death. Not only is it concerned with the composition of the substances found in the organism, but also with their method of manuf. In this inquiry into the chemical activity of the organism, B. is intimately connected with the origin of life, and some biochemists think that one day it may be possible to synthesise living organisms.

The role of B. in medicine (q.v.) is becoming increasingly important. The earlier concept of diseases as possessing, as Sydenham (q.v.) put it, 'certain distinguishing signs which Nature has particularly affixed to every species,' has given way to the concept of disease as a disorder of function. Since the basis of all physiological function is chemical change it can be seen why the biochemist is playing an ever greater part in the diagnosis, control, and cure of disease and in the understanding of normal function. At the beginning of the cent., chemical pathology, which may be said to be the application of biochemical methods in the investigation of disease, had reached the stage of qualitative tests for urinary abnormalities, chemical examination of the stools, and some crude tests of gastric function. The technique of

gastric analysis was perfected in the early 1920's. At about the same time, with the advent of the practice of venepuncture as a commonplace procedure, the blood chem. began to be investigated and correlated with the chem. of the excretions. Hugh MacLean and de Wesselow invented a test for the quantitative estimation of the sugar in blood which was a landmark in the investigation of carbohydrate metabolism. The test became of great importance in the diagnosis of diabetes (q.v.) and in the stabilisation of diabetic patients treated with insulin. Van Slyke's method of estimating the amount of urea in the blood was equally important in estimating renal function (see KIDNEY and URÆMIA) and led to the use of what is known as the urea-clearance test, a test which measures the amount of urea which the kidneys can excrete in a given time. Meanwhile, in 1918, Francis Benedict had pub. the first practical method for estimating the basal metabolism (see THYROID GLAND, *Basal Metabolic Rate*). Investigations of liver function and fat metabolism soon followed. The discovery by Bayliss and Starling in 1902 of secretin (see HORMONES) opened up the science of endocrinology as we know it to-day. Something was known before of the clinical manifestations of glandular deficiencies, and Grave's disease, Addison's disease, myxoedema, and acromegaly (q.v.) had been described. But the essential nature of the secretions of the ductless glands, the hormones or 'chemical messengers,' which exerted a humoral as against a nervous control in the body, was unknown. The discovery of secretin introduced a new field of discovery to the biochemist. Gradually all the known hormones have yielded up their chemical secrets, and by the ingenuity of the biochemist some of the most complex have been synthesised. Others have defied synthesis. The function of the ductless glands and the hormones are described elsewhere under their separate headings. Recently the biochemist has enlisted the aid of radioactive isotopes. The development of the discovery by Curie and Joliot in 1934 that ordinary elements which are found in nature in the stable state can be induced to become radioactive has put in the hands of investigators a wide variety of elements of biological interest, which by means of special recording instruments can be traced in their progress through the body by their radioactivity. 'Labelled' atoms are followed in the myriads of complicated reactions which occur in the body in health and disease. Radioactive iodine has been used to study the physiology of the thyroid gland (q.v.). Radioactive phosphorus has been used in the study of the blood and its disorders, in the investigation of the metabolism of nucleo-proteins and in tracing the fate of labelled antigens and the rate of antibody production. Radioactive calcium has contributed to the knowledge of bone growth, and radioactive sulphur to that of the role of sulphur-containing amino-acids

in protein metabolism. The biochemist is intimately connected with the story of the vitamins (q.v.), and recently has scored a triumph in completely elucidating the chemical structure of the anti-anaemia factor, vitamin B₁₂, or folic acid (see LIVER). Much has yet to be learnt of the B. of allergy, but the liberation of histamines has already been estab. as an essential link in the allergic reaction. Enzymes occur in all the digestive juices and are able to convert certain foods into digestible form. The conversion of proteins, fats, and starches into soluble compounds in both plants and animals is brought about by various enzymes, which resemble catalysts in that they remain unchanged at the end of the reaction. Bacteria and yeast secrete enzymes of industrial importance and the action of many of these has been very extensively investigated. The discovery by Pasteur (q.v.) that alcoholic fermentation was due to an active substance in the yeast cell, later known to be an enzyme, was the forerunner of the discovery by biochemists of a whole series of enzymes occurring in animal and plant life (see ENZYMES; FERMENTATION; DIGESTION). The nature and action of many enzymes has still to be elucidated and the existence is assumed of many others as yet unknown. For instance, decomposition is known to be due to enzymes liberated by bacteria, and it is thought that the morbid effects of infection in man may be similarly due to bacterial enzymes, and that antibodies and antitoxins formed in reactions of immunity may be in the nature of anti-enzymes.

The biochemist is also concerned with therapeutics, and the advances made since 1934 in chemotherapy and antibiotic therapy is a story in itself. More and more is the biochemist exploring within the confines of the cell and its nucleus and trying to elucidate the chemical mysteries of the protein synthesis which goes on there—a synthesis which is the basis of cell div. The key to the problem seems to be a protein substance called deoxyribonucleic acid which is situated in the chromosomes (q.v.) and may make up as much as 64 per cent of the weight of the nucleus. The presence of deoxyribonucleic acid in this situation strongly suggests that it is the functional part of the genetic apparatus. It is thought that it has a double function—first to produce a substance, the primary gene product, which can be dispatched to the cytoplasm of the cell to control its activity, and, secondly, to produce a replica of itself at cell div. How it does this is a complicated story which is still partly a matter of supposition. There is strong evidence, however, for the theory that deoxyribonucleic acid is the master substance which decides all the activities of the cell and that another somewhat similar substance, ribonucleic acid, is the servant which translates the decisions into action. The evidence indicates that deoxyribonucleic acid makes ribonucleic acid

which, in its turn, makes the specific proteins which are necessary for cell activity.

The B. of the brain and central nervous system, which, beside the hormones, is the other master controller of body function, is yet in its infancy (see PSYCHOPATHOLOGY). Greater knowledge of the chemical reactions of brain function will lead to greater knowledge of the nature of brain diseases, of which little is known at the moment. This brief sketch of the field of B. is sufficient to show that there is no aspect of the body's function with which the biochemist is not directly concerned. In fact, B. may be said to hold the key to the mystery of life itself. See J. S. Kleiner, *Human Biochemistry* (2nd ed.), 1951, and E. S. West and W. R. Todd, *Textbook of Biochemistry* (2nd ed.), 1955.

Biogenesis, term used to express the theory that all forms of life owe their origin to antecedent life ('omne vivum ex vivo'), as opposed to abiogenesis (q.v.), which maintains that it may be possible to produce life from inorganic matter. The terms are used in connection with a biological controversy which recurs from time to time, though Pasteur's refutation of abiogenesis is now usually regarded as conclusive, except perhaps in the case of viruses (q.v.). B. is also expressed by homogenesis, which means that the living organism produces by sexual reproduction, spore formation, or partition, organisms resembling the parent, though the resemblance to the immediate parent may not, of course, be exact. See BIOLOGY.

Biography (Gk *bios*, life; *graphē*, writing), that branch of literature which deals with the hist. of the lives of individual men. The first known instance of the use of the word *biographia* is in the work of Damascius, a Gk writer of the early 6th cent. The word does not appear to have been used in England until the 17th cent. Fuller, in his *Worthies*, 1662, referred to the 'biographists of these saints,' and in 1683 Dryden defined *biographia* as the 'history of particular men's lives,' in all parts of which 'Plutarch equally excelled.' B., in its most rudimentary form, exists in the early literature of all nations. The hist. of the lives of national heroes, coloured by popular imagination, may be traced in the myths of gods and giants and insuperable warriors. Jewish literature abounds in B., as it affects the hist. of the race. The O.T. is full of the lives of patriarchs, kings, prophets, and great women who left their work on the religious and social hist. of the Jews. The earliest examples of B. written with a conscious effort to narrate the true hist. of particular men, are probably to be found in Gk literature. In Gk and Rom. literature B. is generally a mere account, in strict historical sequence, of the chief events of his hero's life. It often took the form of a funeral panegyric, and the aim of the writer was strictly a moral one. His hero must either be an example or a warning. Every noble action is emphasised with grave eulogy; the consequence

of every deed pointed out and if necessary censured. Xenophon's memoir of his master Socrates is one of the earliest B.s that have come down to us from the Greeks. By far the most interesting is the *Parallel Lives* of Plutarch (AD 46-120). The lives number 46, and the Gk and Rom. heroes are arranged alternately as a parallel to each other. Plutarch excels all anc. writers of lives. His rare gift of sympathy with his subject, and his powers of selection and of seeing what is interesting, are only equalled by the best of modern biographers. North's trans. appeared in 1679, and had a remarkable influence on the Elizabethan dramatists. Other B.s of note, belonging to Gk literature, are Philostratus's *Life of Apollonius of Tyana*, the Neo-Pythagorean saint, and his *Lives of the Sophists*; Diogenes Laertius's *Lives of the Philosophers* (3rd cent.); Eunapius's *Lives of the Sophists* (4th cent.); and the *Life of Plato*, by Olympiodorus of Alexandria. The Augustan age of Rom. literature contains many fine specimens of B. *De Viris Illustribus* of Cornelius Nepos (c. 99-24 BC) is frequently historically inaccurate, but is of great interest. *The Life of Alexander the Great*, by Q. Curtius Rufus, is not so much biographical as historical, and is over-weighted with general reflections and rhetorical speeches. Tacitus's life of his father-in-law (*De vita et moribus Iulii Agricolae*), written c. AD 98, is a stately work, and contributes to our knowledge of the hist. of the times. The *Lives of the Twelve Emperors*, from Caesar to Domitian, written by Suetonius Tranquillus about AD 120, are rhetorical studies. Suetonius shows indifference to chronological exactness, and is by no means an impartial historian. Another B. of note is the monograph by Sallust (86-c. 34 BC) on the conspiracy of Catiline. St Jerome's *Lives of the Fathers* belongs to a later period.

The B.s of the Middle Ages were frequently written in the cloister or the cell; and the subjects chosen were saints, martyrs, abbots, bishops, and the like. In England many B.s of this kind were written in Lat. Bede (673-735) wrote lives of St Cuthbert (one a metrical version of considerable length, and one in prose), and also *Lives of the Abbots of Wearmouth and Jarrow*, the material for which he found in certain anonymous lives of these saints. Aldhelm, Bishop of Sherborne (d. 709), composed a prose treatise in praise of virginity, which he illustrated by the lives of a number of men and women—scriptural characters, hermits, monks, and saints—examples of chastity. Other lives of interest to the student of Early Eng. literature are *The Life of St Columba*, by St Adamnan (625-704); *Vita Caroli Magni*, a life of Charlemagne, written about 820 by Eginhard; *Lives of the Saints*, by Aelfric; *Wulfstan*, by Wm. of Malmesbury; *Wilfrid of York*, by Eddius Stephanus; and *St Guthlac*, by Felix. *The Life of Alfred*, by Asser, Bishop of Sherborne, has the distinction of being the earliest B. of an Eng. layman. During the 16th

and 16th cents. there was a fair output of this species of writing, but the form and the scope of B. did not develop to any great extent. Latin was frequently chosen as the medium of expression, and the style and form modelled on that of Livy and Sallust. The chief B.s to be noted here are *Illustrium Majoris Britanniae Scriptorum Summarium*, 1584, by John Bale (1495-1563); *Commentarii de Scriptoribus Britannicis*, by John Leland (d. 1532); a *Life of Sir Thomas More*, by his son-in-law, Wm Roper (1496-1578); a graceful *Life of Cardinal Wolsey*, by George Cavendish (1500-c. 1561), which remained in MS. till the 17th cent.; and *History of the Life and Death of King Edward V and the Usurpation of Richard III.*, by Sir Thomas More, written between 1513 and 1514, and printed in 1657. Bacon's *History of Henry VII* appeared in 1621. In this an effort is made to analyse the motives and purposes of the chief actor, and everything is subordinated to or explained by his actions. In this analytic handling of his subject Bacon made a clear advance on the methods of his predecessors. All modern B.s, which aim at giving an artistic and truthful presentation of the life and character of an individual, must acknowledge their debt to the admirable *Lives of Isaac Walton*, written between 1640 and 1678. Walton had a sympathetic understanding, and his pleasing style and the revelations of his own pious and kindly personality combine to make the *Lives* attractive to modern readers.

So far it will have been noticed that the men chosen as subjects of B. are those whose lives bear directly upon the hist. of the Church and State. Men of letters were not considered to be of such influence and importance as to warrant a B. Even Walton's heroes were not wholly scholars. Drummond of Hawthornden's *Notes on Conversations with Ben Jonson*, 1619, though not strictly speaking a B., revealed the character of a man of letters in conversation, and proved that a man's character may be revealed in his trivial as well as in his serious remarks. From this time the scope of B. began to expand. Anthony à Wood (1629-95) chose the writs of Oxford for the subject of his *Athenae Oxonienses*; John Aubrey (1629-97) pleasantly sketched the lives of his immediate predecessors and his contemporaries in his *Brief Lives*; Thomas Fuller (1608-1661) wrote extensively, with numerous digressions, of the notable men of each co. in his *Worthies of England*, 1661. Thomas Sprat, Bishop of Rochester (1636-1713), reverted to the old classic models in his *Life of Cowley*, 1668, where he expounded that all familiar anecdote was out of place in a B., and that moral effect was the thing to be aimed at. Before the end of the 17th cent. 2 lives of Milton were in print, one by Edward Phillips, pub. in 1694, and one by Toland, in 1699. Lord Herbert of Cherbury (1583-1633), and Anne Harrison, Lady Fanshawe (1625-80), were the earliest to write lives of themselves. Another early autobiography (1656) is that of Margaret

Lucas, Duchess of Newcastle, who also wrote a life of her husband in 1667. With these autobiographies must be noted certain diaries, which were, after all, autobiographies not intended for pub. The most important of these is the famous *Diary of Pepys* (1633-1703), written between 1660 and 1669. Its value was unrecognised till the 19th cent., and an incomplete ed. was first pub. in 1826 by Lord Braybrooke. Notice must also be paid to the *Diary of Evelyn*, written between 1641 and 1697.

B. attained its most perfect form at the end of the 18th cent. in James Boswell's *Life of Dr Johnson*. The qualifications required of a good biographical writer are numerous. He must, of course, have a knowledge of the facts and access to authentic documents relating to the life of his hero. This is by no means all. The ideal modern biographer should not merely be in touch, through his own technical knowledge, with the work and ambitions of his hero; he should have a sympathetic understanding of his hero's character. He should be able so to present his hero that the reader is left with the feeling that he himself has known the man. Everything must be subordinated to the central figure; no incident, no person that does not influence the life or the character of the hero, should be introduced. The biographer must possess a knowledge of psychology; he must be able to analyse motives, and to arrange his material and group his characters to the best effect. In fact, in order to reveal the personality of his portrait he must create as well as reproduce. *The Life of Dr Johnson* is thought by many to have no rival in the whole realm of the world's literature. Boswell had an unbounded admiration for his hero; an intimate knowledge that would be hard to surpass; and the happy knack of an artist in selecting and grouping his material. Among the most prominent B.s written by men almost as great as their heroes are Boccaccio's *Life of Dante*, Dean Stanley's *Life of Dr Arnold*, and Lord Morley's *Life of Gladstone*. Excellent B.s were written in great number during the 19th cent. The great modern classics in this branch of literature are Southey's *Life of Nelson* and *Life of Wesley*; Lockhart's *Life of Scott*; Forster's *Life of Dickens*; Trevelyan's *Life of Macaulay*, and his *Life of Charles James Fox*; Carlyle's *Lives of John Sterling, Frederick the Great, Schiller, Oliver Cromwell*; Moore's *Life of Byron*; Mrs Gaskell's *Life of Charlotte Brontë*; Sir Theodore Martin's *Life of the Prince Consort*; and Dowden's *Life of Shelley*. Cross deviated from the ordinary form of B. in his *Life of George Eliot*, 1884. He arranged her letters in chronological order, headed by brief introductions or explanations, allowing her character to reveal itself in her correspondence. Cross's method has by many writers been adapted and combined with a B. Mason, in his *Life of Gray*, 1744, was the first to insert familiar letters, written to intimate friends, for the purpose of illustrating the

character of his hero. A great fault of some B.s is the lack of the power of selection in the author. A great amount of industrious research and scholarship is put into the work, but the biographer fails to present a living portrait of his subject. An example of this kind of work is Masson's *Life of Milton*. Masson gives a great amount of information about the politics and lives of Milton's contemporaries, and introduces in detail many people and incidents which only indirectly bear upon the life and character of the poet. During the 19th cent. all manner of men had their interest quickened in different branches of art and science; and numerous B.s, autobiographies, and memoirs have been pub. These have dealt with leading men in all walks of life. Autobiographies have been written in great number by all manner of men and women, such as Gibbon, Hume, Franklin, Talleyrand, Harriet Martineau, Oliver Wendell Holmes, Leigh Hunt, Scott (in his *Journal*), Ruskin (*Praeterita*), Carlyle (*Reminiscences*), Goethe (*Dichtung und Wahrheit*), Sir Henry Taylor, Edmund Gosse (*Father and Son*), etc. Sometimes an autobiography has almost taken the form of fiction, as in Borrow's *Lavengro*. Halliwell-Phillips has said with truth that the writing of modern B.s has been 'carried to a wasteful and ridiculous excess.'

In the 20th cent. one of the most remarkable B.s is Monypenny's and Buckle's *Benjamin Disraeli, Earl of Beaconsfield*, which appeared in 6 vols., 1910-20; and as a reference book on its subject, Morley's *Gladstone* suffers by comparison. Smaller B.s, however, became the fashion. B. in general has also on the whole been rendered more sincere and more readable by abolition of the conventional frontier between matters to be put in a life and those that should be glossed over. Two Brit. monarchs have been subjected to candid treatment: in Lytton Strachey's 1-vol. *Queen Victoria*, 1921, and in Sir Sidney Lee's *Edward VII* (in 2 vols.), 1925-6. Lytton Strachey's *Eminent Victorians*, 1918, is probably the most remarkable biographical work of its size; it is 1 small vol. dealing with 4 lives—Cardinal Manning, Florence Nightingale, Arnold of Rugby, and Gen. Gordon. Bernard M. Allen's *Gordon and the Sudan*, 1931, disposes of the malicious picture of Gordon presented by Lytton Strachey, whose conception of Gordon was based on a hasty generalisation from unreliable material. Indeed much of Strachey's work is marred by its straining after effect, e.g. in his sketches of Mme du Deffand, Horace Walpole, and Frederick the Great, and above all in the cloying study of *Elizabeth and Essex*. It may be said that Lytton Strachey has been the main influence in 20th-cent. B., particularly in reaction against the formal official 'Life' of the preceding cent., and the writing of B. has been one of the outstanding features of Eng. and Amer. authorship since the First World War. The growth of interest in psychology is one explanation of this, but the

pervasive irony of Strachey, the wish to revalue (or 'debunk') the 'great' in the light of modern interpretative psychology cannot alone account for the popularity of B. Writers appear to be attracted to B., also perhaps because the central life story of an individual may well serve other interests, such as historical research, literary criticism, social study, and in some instances, no less legitimately, creative and imaginative works of art. B. has therefore gained these interests as ballast against its use for motives of social satire, and the full-length study as against the short and biting pen-portrait came into its own again by the third decade of the cent. Of the many modern authors of biographical works, it is possible to name only a few. A high reputation in popular esteem was won by Philip Guedalla, particularly for his life of Wellington. Harold Nicolson, Hugh Kingsmill, Hilaire Belloc, Hesketh Pearson, Osbert Burdett, John Forster, should be mentioned in Eng. literature; Gamaliel Bradford, Van Wyck Brooks, Katherine Anthony, Joseph Krutch, and Matthew Josephson in Amer., and among continental writers with international reputation André Maurois, Stefan Zweig (d. 1942), Emil Ludwig (d. 1948), and Salvador de Madariaga. Special mention may be made of the monumental life of the Duke of Marlborough, *Marlborough, his Life and Times*, written by Winston Churchill, and pub. in 4 vols., 1933-8. The 20th cent. has above all been the flourishing period of autobiography. There is hardly a writer of note who has not written his own life or reminiscences, and many of them have extended such work to sev. vols.; examples of this are Sean O'Casey's 6-vol. autobiography, beginning with *I Knock at the Door*, 1939, and ending with *Sunset and Evening Star*, 1954; with it may be grouped the series of family memoirs by Sir Osbert Sitwell and Siegfried Sassoon's series of reminiscences.

The biographical dictionary dates from the 16th cent., and first made its appearance at Zürich in Switzerland with the pub., in 1545, of *Bibliotheca Universalis* of Konrad Gesner. It is in effect a catalogue (in Greek, Latin, and Hebrew) of past writers with the titles of their works. A second part, *Pandectarium*, was pub. in 1548-9. Other early works of this sort are *Prosopographia* of Verdia de Vauprivas (Lyons), 1573, the Bollandists' *Acta Sanctorum*, 1643-1788, and Pierre Bayle's *Dictionnaire historique et critique*, 1696. A dictionary of national B. was pub. in Sweden in 23 vols., 1835-1857. Other nations followed; and such dictionaries have appeared in Dutch (1852-78), Austrian (1856-91), and German (1875-1900). The Brit. *Dictionary of National Biography* was begun in 1882, under the editorship of Leslie Stephen, who was succeeded by Sidney Lee. It was issued in 63 vols., with 2 supplements forming 5 vols. more to bring it down to the end of 1911. Under new auspices and on a less comprehensive plan it had a 'Twentieth Century' vol. (1912-21) added

in 1927, and since then 2 other vols. have been issued covering the periods 1922-30 and 1931-40. A comprehensive work which supplies references to the main Eng. biographical dictionaries is Abert M. Hyamson's *Dictionary of Universal Biography* (2nd ed.), 1951. A *Dictionary of American Biography*, resembling the D.N.B., was begun in 1928, and completed in 21 vols. in 1937, with a supplementary vol. pub. in 1944. Other biographical dictionaries have been brought out in different countries. Nearly every country has now a *Who's Who*, which gives a brief outline of the life and work of living men who have distinguished themselves in various ways. Cyclopaedic biographical dictionaries include *Biographia Ecclesiastica*, 1704; *Biographia Britannica*, 1747-60; *Biographica Classica*, 1778; Michaud's *Biographie universelle*, 1811-28 (new ed., 45 vols., 1842-65); *The English Cyclopaedia*, with biographical section, 1856-7; *Nouvelle Biographie générale*, 1857-66; Chalmers's *Biographical Dictionary*, 1812-17; Sparks's *Library of American Biography* (10 vols.), 1834-8; Vapereau's *Dictionnaire universel des contemporains*; *Dizionario Biografico* of Gubernatis, 1880; Rose's *New General Biographical Dictionary*, 1829-47; Hammerton's *Concise Universal Biography*, 1935; Webster's *Biographical Dictionary* (latest ed.), 1943; Chambers's *Biographical Dictionary* (latest ed.), 1946; and D. C. Browning's *Dictionary of Literary Biography* (English and American), 1958.

See H. Nicolson, *The Development of English Biography*, 1928, and A. Maurois, *Aspects of Biography*, 1929.

Biology (Gk *bios*, life; *logos*, discourse), science of life. It attempts to survey all the phenomena manifested by living matter, and includes the sciences of morphology, physiology, genetics, embryology, and ecology. Besides treating generally of the life and origin of animals and plants, it includes the bacteria, viruses, and other organisms which do not fall readily into the sub-sciences of botany and zoology.

B. is also used in a more restricted sense within the science of life to indicate the way in which an animal or plant lives in its natural environment.

Two main aspects of biology. From the beginning of its hist., B. discovers 2 main types of investigator at work: the observer of living things, who records accurately what he sees; the theoretical worker who attempts to systematise the accounts he receives from observers. New forms of life and new species are still being discovered, while a detailed investigation of known forms is constantly being applied to them. B. has thus developed along the parallel lines of increasingly intensive and extensive observation, and of increasingly comprehensive generalisation. But observation is the fundamental basis of the science, and no finality can be claimed for B. until the whole field of living matter has been exhaustively surveyed.

History of the rise of biology. Men,

however primitive their mode of life, are dependent for their sustenance upon a limited number of plants and animals. As hunters and herders, it is essential that they distinguish a number of animals from one another, and that they do not confuse useful with harmful plants. The div. of living things into the 2 great categories of plants and animals was achieved by primitive peoples; further, animals were classified into birds, beasts, and fishes, and plants into trees, shrubs, and herbs. To some extent, then, primitive man had already made the distinctions which latterly categorise the 2 great groups of naturalists. The empirical folk knowledge thus accumulated in the course of many hundreds of years through the observation of nature becomes classified even whilst it is being collected, and is to be regarded as the foundation of the early stages of the science. The Babylonians possessed knowledge of higher animal forms and of human anatomy, and had developed theories of the functions of the visceral organs. In Egypt, also, the sacred animals were studied with minute care. The development of the scarab was known, the metamorphoses of the frog and the fly had been observed, and observations of various parasitic worms had been made. The Egyptian custom of embalming the dead led to a knowledge of the structure of the human body. However, in spite of the accumulation of facts in Egypt and Babylonia, it is to Greece that we must turn for the earliest attempts to organise such knowledge in systematic form. Hippocrates (460-377 bc) discarded magical theories of disease; Aristotle (384-322 bc) originated scientific classification. He was acquainted with over 500 forms classified by modern zoologists, all Greek and mainly marine. He was the founder of comparative anatomy, and his chief interests were anatomical and morphological. His disciple, Theophrastus, paid special attention to the botanical side of biology, doing for botany what Aristotle had done for zoology. The influence of Aristotle and his immediate successors led to the development of the school of medical study in Alexandria under the Ptolemies, where B. was studied, with anatomy and physiology, in relation to medicine. In the 1st cent. of the Christian era, the Roman, Pliny, compiled his *Natural History* from a number of sources: a work which made him, after Aristotle, the most influential of the biologists of classical antiquity. Galen (b. AD 131) stood on the borderland between antiquity and the Middle Ages. He began the study of the component parts of the living organism. He recognised the difference between sensory and motor nerves, he described the heart and blood-vessels in detail, and studied the process of respiration. Throughout the Middle Ages little or no progress was made with the study of B., and Galen's work remained unquestioned until the 16th cent., when fresh work was begun. Vesalius (b. 1514 or 1515 at Brussels) became prof. at Padua, and carried out investigations into anatomy by means of

dissections of the human body. In theory he followed Aristotle and Galen, but he corrected a great many false beliefs and made many new discoveries. Gesner (b. 1516 at Zürich) wrote the *Historia Animalium*. Aldrovandi (b. 1522 at Bologna) was also a zoologist, but in connection with his work in Bologna planted a botanical garden. Rondelet (b. 1507 at Montpellier) wrote *De piscibus marinis*, a work which groups together not merely fishes, but also crustaceans, worms, molluscs, echinoderms, and other aquatic animals. Caesalpinus developed the work of classifying plants which Gesner had begun, using, for the first time, their seeds as a basis. Generally



WILLIAM HARVEY

speaking, these pioneers of the Renaissance specialised in their researches so that botany, zoology, and human anatomy developed as distinct sub-sciences of B. Progress was made more rapidly in the 17th cent. Fabricius ab Aquapendente (1537-1619) discovered valves in the veins, and Harvey (b. 1578 at Folkestone) made the discovery of the mechanism of the circulation of the blood, and the means by which it is supplied with nutritive materials. Harvey's work was a great incentive to further research and discovery, particularly in the case of morphology and physiology of animals; from this time onwards morphology—the analysis of living structures into component parts—and physiology—the functioning of living structures—become the prin. sub-sciences of B. By asserting that all animals are produced from an ovum, Harvey also laid the foundations of embryology. Just before this time, Gasparo Aselli (1581-1626) had discovered the lacteal vessels, in the course of a vivisection experiment on a fully fed dog, and Bartholin (b. 1616 in Copenhagen), following up this work, discovered the

nature of the lymphatic ducts. Rudbeck (b. 1630 at Vasterås) had made this discovery independently somewhat earlier, but Bartholin's account was pub. first. Robert Hooke (b. 1635) described in 1665 the cellular structure of thin slices of cork; Malpighi (b. 1628 at Crevalcore) discovered the capillaries of animal blood systems and the stomata in leaves, while Nehemiah Grew (b. 1628) independently worked on the fine structure of plants. Grew and Malpighi freely exchanged their ideas, and besides founding microscopical anatomy, formulated the idea that the structure of organised living matter is something unique. This view remained at this stage until the development of the cell theory nearly 200 years later. Leeuwenhoek (b. 1632 at Delft) applied himself to improving the microscope, and studied animal spermatazoa. He discovered the Infusoria and Rotifera and is credited with drawing bacteria for the first time; the 3 main shapes are shown in figures of scrapings taken from his teeth. In the botanical field he showed the difference of structure between the stems of monocotyledons and dicotyledons. Most important, he first questioned the view that any living creatures could be generated spontaneously by putrefaction, insisting that they are produced by reproductive processes. Swammerdam (b. 1637 at Amsterdam), combining fine dissection with microscopical technique, investigated the anatomy of invertebrate animals, and laid the foundations of modern entomology. He explained the development of the frog and of insects on rational principles, and also made observations on the physiology of muscle; he showed that there is no change in volume when a muscle contracts. Another Dutchman, de Graaf (b. 1641), by his study of the sexual organs, overthrew the Aristotelian doctrine that the embryo is the product of the male semen alone, and gave an account of the true character of fertilisation. John Ray (b. 1627, near Brain-tree; d. 1705) and Francis Willughby (q.v., 1635-72) applied themselves to the problem of classification; Ray applying himself at first especially to botany, and Willughby to zoology. Ray's important pub. was the *Historia plantarum generalis*, in which he summarises all the botanical knowledge of his time, and lays the foundations of an anatomical classification of plants, which prepared the way for the work of Linnaeus in the following cent. Hermann Boerhaave (b. 1668, near Leyden) made a close study of the general structure and functions of the human body, and presented the results of his survey in terms which more closely resemble the conclusions of modern B. than the work of his contemporaries. He sought to explain many biological phenomena in terms of chem. and physics. Albrecht von Haller (b. Bern, 1708; d. 1777) laid out a botanical garden at the univ. of Göttingen, and sought to set up a natural system of plant classification; in physiology he investigated muscular irritability, extended knowledge of the

circulation of the blood, and in comparative anatomy. Charles Bonnet (b. 1720 at Geneva; d. 1793) studied insect B., but, compelled to give this up through failing sight, applied himself to speculative B. His discovery of parthenogenesis, his observations of the metamorphoses of insects, and contemporary studies of regeneration and reproduction by fission, led him to work out in detail theories of development. He originated the catastrophic theory of creation, according to which the earth has undergone a series of developments, each of which has been cut short by a great natural catastrophe, which has destroyed the forms of life, though leaving intact the germs from which life was to develop



COMTE DE BUFFON

when the catastrophe has ended. Bonnet was impelled to consider together botany, zoology, anatomy, morphology, physiology, and comparative anatomy, thus unifying those sub-sciences which had been developing independently. De Buffon (b. 1707 at Montbard; d. 1788) pub., in 1749, the first part of his *Histoire naturelle*, which engaged him for the rest of his life. He attempted the task of unifying the study of the earth with the study of living forms by regarding the hist. of the earth as related to the development of living creatures. With him the geographical distribution of animals and plants on the surface of the earth becomes significant. Linnaeus (1707-78) pub. the *Systema naturae*, in which he expounds his system of classification. This system laid the basis of classification as we know it to-day; and, through it, the biologist has been able to handle the material which has accumulated as the result of the labours of those engaged in observations and descriptive work. But Linnaeus committed himself to the view that species were immutable, and would ever remain so, each having

originated as such through a special act of creation. Meanwhile the sub-science of palaeontology had been founded by Paley the potter, who correctly asserted that fossils are the authentic traces of extinct life; and by John Hutton (1726-97), who taught that present processes are adequate to explain the formation of stratified rocks and the existence of fossils. Bichat (b. 1771 at Tholozan (Jura); d. 1802) carried out investigations of tissues by means of the microscope, which entitle him to be regarded as the founder of modern histology. Sprengel (b. 1750 in Brandenburg; d. 1816) pub. in 1793 a general theory of fertilisation in the vegetable kingdom, which in essentials still holds good. Robert Brown (1773-1858) first discovered the cell nucleus, and his early work on the flora of Australia was a pioneer piece of plant geography. Lamarck (b. 1744 in Picardy; d. 1829) challenged the fixity of species, arranging animals in series on the basis of the presence or absence of certain organs. The development of these organs, and their presence or absence, he ascribed to habits. He is thus the propounder, not merely of a theory of evolution, but of a theory of the evolutionary process. In a modified form, his views were held by one of the 2 great groups of protagonists over evolution, namely the Neo-Lamarckians. Von Baer (1792-1876) made important contributions in the field of embryology. His discovery of the actual mammalian ovum enabled him to follow the successive stages of embryological development. He showed the affinities of vertebrates through study of comparative embryology, and enunciated the principle that the development of the individual is a recapitulation of the development of the group of which it is a member, an idea which was later elaborated by Ernst Haeckel (1824-1919). Schleiden (b. at Hamburg; d. 1881) first regarded the plant as a community of separate cells. Schwann (1810-82) took up Schleiden's theory, and showed that it applied to animals, arguing that the whole plant or animal organism is composed of cells and the products of cells. Dujardin (1801-60) first used the term 'sarcode,' later supplanted by 'protoplasm,' to denote the living material of which simple organisms consist. Hugo von Mohl (b. 1805 at Stuttgart; d. 1872) carried this work farther, and is regarded as the founder of modern plant cytology. Virchow (b. in Pomerania; d. 1902) applied the results of the cell theory to pathology, and Max Schultze (1825-74) estab. the fact that protoplasm is the fundamental substance of the cell, and that the structures formerly supposed to be essential were products of the living protoplasm. Claude Bernard (b. 1813 at Saint-Jullien; d. 1878) was a pioneer in the field of experimental biology. To him is due much of our knowledge of the digestive processes in the alimentary canal. He also showed that sugar, formed as a product of digestion, is temporarily stored in the liver as glycogen. In the second half of the 19th cent. Charles Darwin (1809-82) and

Alfred Russel Wallace (1823-1913) simultaneously propounded the theory that species originate as a consequence of 'natural selection' or the 'survival of the fittest.' This theory was based on the observation that individuals of a species vary in small but significant details from each other; it does not attempt to explain how these variations originate, but shows that, since some are advantageous and some disadvantageous, their possession assists or handicaps animals in their struggle for life. Francis Galton (1822-1911) developed a theory of eugenics which seeks to elucidate all those agencies which affect racial qualities. In connection with the development of the theory of evolution by means of natural selection, the names of Thomas Henry Huxley (1825-95), Ernst Haeckel (1834-1919), and Herbert Spencer (1820-1903) must be mentioned. Carl Gegenbaur (b. 1826 at Würzburg; d. 1903) worked to confirm Darwin's hypothesis by means of comparative anatomy, showing by means of anatomical comparisons the relationships, due to descent, between the various forms of animals. Like Haeckel, Gegenbaur sought to establish genealogical trees for existing species of animals, and gaps in the line of descent were filled with 'missing links.' The discovery of fresh facts has done away with many of these. Under the influence of Darwinism a great deal of specialised work in the various sub-sciences into which B. is subdivided has since been accomplished in the last fifty years. In anatomy the names of Wiedersheim (1848-1923) and Arnold Lang (1855-1916) must be mentioned; in embryology, Kowalewsky (1844-1901), Oscar Hertwig (1849-1922), Richard Hertwig (1850-1937), Sir Edwin Ray Lankester (1847-1929), Wilhelm His (1831-1904), and Francis Maitland Balfour (1851-82). In cytology, Strasburger (1844-1912) elucidated the problems of nuclear div. in vegetable cells, whilst Flemming (1843-1905), Fol (1845-92), Bütschli (1848-1920), van Beneden (1845-1910) and Boveri (1862-1915) made many advances in cytological technique; in the specialised field of the cytology of nervous structure the names of Golgi (1844-1926), Ramón y Cajal (1852), Ehrlich (1852-1915), Ranvier (1835-1922), and Nissl (d. 1919) are all connected with important discoveries. The advances in technique made by these workers in the cytological field have made possible the researches which have revealed the details of the process of fertilisation, and thus opened up possibilities of studying experimentally the mechanism of heredity. Meanwhile controversies arose regarding a number of issues, such as the question of the origin of variations, and the transmissibility of 'acquired' characters. Weismann (1834-1914) worked out a theory of inheritance based upon cell structure. His theory of the structure of the germinal cell and its material ('germ plasma') is partly speculative and partly based upon contemporary research, and denies the possibility of any transmission of the effect of habit or practice.

Semon (1859-1919) elaborated the 'mneme' theory for the purpose of accounting for the transmission of acquired characters: modifications in the soma of an organism leave impressions ('engrams') on the germ cells in the same sort of way as impressions are formed in the brain by outside stimuli. Hugo de Vries (b. 1848 Haarlem; d. 1935) pioneered in the field of modern genetic research, and discovered 'mutations,' i.e. sudden large variations. Mendel (b. 1822* at Heinzendorf; d. 1884) carried out a series of experiments on the hybridisation of peas, which remained almost unknown till after his death. The rediscovery of his work was practically the beginning of a period of brilliant investigations of the problems of heredity and the transmission of characters, which is still being carried on and developed. The names of Bateson and Punnett (in England), Baur and Correns (Germany), Czermak (Austria), Lang (Switzerland), Cuenot (France), E. B. Wilson and T. H. Morgan (U.S.A.), are outstanding in this field. Another development in modern B. is that of biochemistry (q.v.), arising in the first instance from the modern chem. of solutions and of ferments and the study of the composition of the various products of animal glands. Cytology, the study of the cell, and particularly its nucleus and chromosomes, is yet another branch of B. which has made tremendous progress in recent years, as a result of work by Strasburger, Darlington, Ruggles Gates, and many others. The chromosomes have been shown to be the carriers of hereditary qualities; many observations on the chromosomal number and behaviour in the cells of an organism have been brought into line with its genetical make-up. Experimental embryology, in the capable hands of Spemann, Vogt, de Beer, and C. H. Waddington, has shown the presence of chemical organisers which are responsible for the differentiation of the parts of the embryo from the segmenting egg.

Logical development of biology. This brief survey of the hist. of B. makes it clear that, on the whole, this hist. has followed a logical order of development. If a perfect logical sequence were possible, we should first seek a complete enumeration of all the forms of life and their natural classification into families. We should seek to know the distribution of the various plants and animals over the earth at the present time and in the past. Analysis of the separate forms would give rise to anatomy, and comparisons of these analyses to comparative anatomy. The attempt to discover underlying unities leads to the generalisations included under morphology, and the analysis of the organism into organ, tissue, cell, and protoplasm; the attempt to study morphology through observation of the development of the organism from the fertilised ovum leads us to embryology. Meanwhile the study of the functioning of the organism has given rise to physiology, which must be studied in terms of the organism as a whole, and also in

terms of organ, tissue, cell, and protoplasm. This, in turn, will involve studies of the effect of environment, heredity, disease. Variation and reproduction, too, must be studied. In every instance results must be arranged under the categories of organism, organ, tissue, cell, and protoplasm. Final generalisations are only possible as these various studies attain completion, and none has yet reached this stage. When, in the past, it has seemed that some finality has been attained, and B. has become dogmatic, the discovery of fresh facts or of a new technique has rendered many of the current generalisations untenable. But any partial generalisation is a gain, provided it subsumes the available facts,



CHARLES DARWIN

since invariably it leads, sooner or later, to fresh investigations and to the further development of one or more of the special sub-sciences which compose B. The most comprehensive generalisation is the the new theory of evolution.

Evolution and the Darwinian revolution. A generalisation as comprehensive as that of Darwin, to be fully justifiable on strictly scientific grounds, needed to be the assimilation and reformation by one mind of the results of many years of work by a large number of investigators. As it was, Darwin owed a great deal to the work of both theoreticians and specialists on the one hand and practical breeders on the other. One invaluable result of his work was that specialists could no longer work in isolation in their own chosen field but had to take the whole of organic nature into account. His work gives no explanation of the origin of variation but points out that variations do occur. Neither does it give any account of the mechanism or the laws of heredity, though it assumes that traits are transmitted. Nor does it attempt to explain the problem of the origin of life, though

it suggests that the multifarious species of plants and animals have developed from a smaller number of species and these again, in all probability, from a still smaller number. Regardless of his suggestions and speculations regarding some of the problems, what is called Darwinism is the doctrine of the origin of species through the operation of natural selection. As such, it called imperatively for work in all the sub-sciences of B. to provide exact information, particularly in regard to (a) the occurrence of variations; (b) the heritability of variations; (c) the role of variations in the struggle for existence.

One of the immediate sources of controversy was the question whether 'acquired' variations (resulting from habit, accident, disease, or education in the lifetime of the individual) could be transmitted—the Lamarckian view. To this question Weismann made an important contribution in his celebrated theory of the germ plasma, which he developed mainly on the basis of work done by him in embryology and cytology. According to him the cells of an embryo are already segregated at a very early stage of its development into 2 kinds—those destined to form the germ cells and those (the remainder) destined to give rise to all other bodily tissues of the germ cells, organised for the purpose of transmitting the germ plasma from one generation to the next. It follows, therefore, that habits acquired by the organism during its life, and hence subsequent to the segregation of the germ plasma, cannot be transmitted. Using the newly described events of cell div., Weismann proposed that the chromosomes in every cell nucleus were composed of minute ultimate elements, each corresponding to a unit character of the eventual developed organism. In the process of producing ovum and spermatozoon, 'reduction divisions' take place, whence half of these unit characters are eliminated, and replaced during fertilisation by the fusion of 2 half-sets of characters. While these theories provided an explanation of variation, they were of course beyond confirmation by microscopic observation. However, in further developments of his theory, it was suggested that, for instance, if a particular organ was not used, its determinants within the germ plasma were weakened and ultimately perished as a result of competition for survival within the organism; this admission that the germ plasma could be modified as a result of a mode of life of the individual organism is of course tantamount to accepting the inheritance of an acquired character. It is also difficult to apply these rigid ideas to plants, where the clear-cut distinction into somatoplasm and germ plasma is often entirely absent.

But research stimulated by Weismann's theory confirmed many of his speculations as to the character of the chromosomes in the nucleus of the germ cells. Modern theories of heredity conceive of invisible elements termed genes, and justify the assumption by means of numerical and quantitative data. Statistical methods

of determining chromosome structure and mapping the component genes are now extremely advanced, but techniques such as the electron microscope offer hope of confirmation of many of these formulations by more direct means. The assessment of these inheritance factors arises from the development of a technique originated by Gregor Mendel, who worked chiefly with peas. Mendel observed that the hybrids produced by crossing tall with dwarf plants were all tall. But by self-fertilising these, he obtained a generation which contained 3 times as many tall as short ones. He explained these results by assuming that the pollen and ovules of the pure dwarf plants contained only a factor 'shortness'



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GREGOR MENDEL

while the pure tall plants produced reproductive bodies with only a factor 'tallness.' When crossing the 2 varieties, all the offspring, regardless of which contributed the pollen and which the ovule, contain one 'short' and one 'tall' factor; all are tall, because 'tallness' dominates 'shortness.' But as the germ cells, when mature, contain only one of each pair of factors present, the hybrids will produce equal numbers of 'tall' and 'short' pollen and of ovules. Hence self-fertilisation must bring these elements together as SS:ST:TS:TT. The three-quarters which contain a 'T' will be tall, and the remaining 'SS' quarter are short. Mendel's work, which was lost for nearly fifty years, led to an enormous programme of research after 1900, chiefly under Bateson and Punnett in Great Britain, which extended and confirmed his ideas, and founded the modern science of genetics. In this, and similar work in America led by T. H. Morgan, it is now clear that many of the inheritance units or genes are not so free as Mendel had supposed but often function as groups, as if they were linked in some way.

Darwin had suggested that variation was progressive, starting as slight deviations from the normal, and tending to increase in successive generations. But the Dutch botanist, de Vries, claimed that offspring could very occasionally—as exemplified by the evening primrose (*Oenothera lamarckiana*)—differ so markedly from their parents as to constitute a new species in one generation. His theory of evolution by sudden 'mutation' of this kind is still considered an essential part of the mechanism, while his insistence on the necessity of studying the relation of variation to the inheritance mechanism was of great importance.

The eventual charge against natural selection was that it stressed too strongly the influence of the environment, rather than what went on inside the organism. The all important factor which was overlooked was the way in which the mechanism in the organism reacted to environmental influence. And it is now clear that such experiments as those by which Weismann sought to disprove that acquired characters could be transmitted (by cutting off the tails of many generations of new-born mice without diminishing the tails of their offspring) are irrelevant. The essence of Neo-Darwinism is that the environment selects from the inherent potential of the organism what is most suitable to survive; the Neo-Lamarckians suggest that things acquired by the organism in reaction to the environment can subsequently be passed to the progeny. For this there is some evidence that such things as temp. acclimatisation might be transmitted; the more extravagant claims of Lysenko (q.v.) have recently been severely criticised. The most startling example of Darwinian selection has been revealed very recently in the resistant strains of insect under the environmental influence of insecticides. Many of these are shown to have been inherent in the animals, and to be simple Mendelian characters.

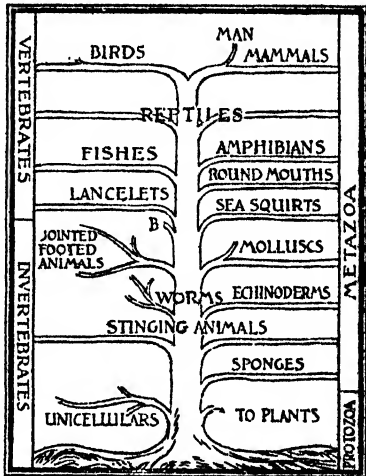
Morphology. As seen in the historical sketch already given, this sub-science was in a rudimentary state when, in the 17th cent., Ray and Willughby set about and succeeded in bringing real order to it. The value of Buffon's great work in natural hist., which includes the accurate morphological description of virtually all that was known in the old world, was still further enhanced by Linnaeus's system of nomenclature. Morphology then becomes a process of subdivision to finer and more microscopic limits. Bichat analysed organs into tissues, Schleiden and Schwann resolved the tissues into cells and Dujardin and von Mohl the cells into protoplasm. To-day ultra-microscopic techniques are resolving the finest structures of cell contents and revealing how remarkably the gross structure reflects the finest constituents. At this level of course, B. is inextricably mingled with biochemistry and physics. As a result of von Baer's study of the development of the complete organism from a single-celled egg, the step-by-step process of elaboration of cells into tissues and

tissues into organs was made clearly known. This process, which reveals much of the story of evolution, constitutes the natural synthesis of which morphology is the analysis.

Physiology. Unlike the observational side of B. covered by morphology, physiology deals with the functioning of organisms, and depends so much on other sciences that it is not surprising to find its development in the ancients was practically nil. The great value of Harvey's demonstration of blood circulation was to reveal the operation of

of its evolution, and is an essential supplement to the study of form or function because they have resulted from evolutionary processes.

Phylogeny is the special study of organisms with a view to establishing their relationships. The earlier problem of classification, before Darwinism, was that of reducing a vast accumulation of material to order for convenience of reference and manipulation. But the Darwinian theory of descent implied that there were relationships existing between the various species of living



THE CLASSIFICATION OF ANIMALS, EXPRESSED AS A GENEALOGICAL TREE

B, *Balanoglossus* (*Enteropneusta*), an important connecting link between vertebrates and invertebrates.

definite organs in essential life processes. Following the pattern of morphology, Bichat and then Virchow revealed successively the functioning of tissues and then cells. To-day comparative physiology reveals a remarkably similar pattern of basic mechanisms and patterns of activity throughout the animal and plant kingdoms, and can often help substantially in establishing relationships between animals. Again, at its finest limits, it merges into chemistry and physics.

Embryology and evolution. The special position of embryology is not only in revealing the continuous process of development in which form and function are elaborated side by side. The parallels between the facts of embryology and of palaeontology forced the realisation that the hist. of the individual organism closely resembles that chronologically increasing complexity of all higher organisms. A study of the embryology of an individual is thus an actual study

organisms. With the help of morphology, comparative anatomy, embryology, and palaeontology, it should be possible to discover lines of descent connecting the various branches of the genealogical tree. Two interesting facts stand out clearly, viz. degeneration and convergence. Forms which differ widely in their adult forms are found to be closely allied in embryonic stages. Fishes in caves lose their eyes, parasites lose their locomotive organs. This return from the complex to the simple by the loss of highly specialised structures is known as degeneration. All along the evolutionary path are found organs which were once required, but are now useless or are adapted to some new function, one which they did not in the first instance serve. These organs are called vestigial, and tend to disappear. Degeneration is evidence in support of the evolutionary theory, according to which variation may be either progressive or regressive, a

regressive variation being as likely to be a factor favouring survival in some environments as a progressive one. On the other hand, adult organisms show characters which would lead us to group them with others, were it not that the hist. of their embryonic development shows the two to be quite unrelated. In the process of adaptation to environment they have evolved structures comparable to those of unrelated organisms which have been compelled to adapt themselves to similar environmental conditions. The facts of convergence and degeneration make clear the need of the phylogenist for evidence gathered from every available source before he is in a position to say definitely in what relationship an organism stands to other organisms. The cases of the worm-like *Balanoglossus* and the lancelet (*Amphioxus*) (q.v.) may be cited. Only a full knowledge of their development would lead anyone to realise that the place of these organisms is not with the worms, and that they have vertebrate affinities.

Nature and Origin of Life. Until recently, though the mass of mankind believed that life owed its origin to an act of creation by a divine being, men were nevertheless ready to believe that living organisms could be spontaneously generated from dead or inorganic matter. Vinegar, left alone, might generate eels. Flies and lice might develop from dust. Bees, or rather 2-winged flies mimicking bees very closely, might be formed inside the carcass of an animal. Men who hesitated to believe in these alleged phenomena might nevertheless believe that micro-organisms might spontaneously be generated in various infusions—in infusions of hay, etc. But, though these beliefs are no longer held, and though it is not seriously doubted that existing organisms are the products of previously existing organisms, 2 questions constantly arise. The first of these is the question of the origin of the first living matter, from which we may assume all living forms to have been derived. The second is the question of the possibility of making living matter from inorganic materials in our laboratories. The latter query has been raised anew recently, partly as a consequence of the success of biochemists in synthesising complex compounds hitherto known only in association with living organisms, and partly as a consequence of experiments in the growing of living tissues, severed from the living organism, over long periods of time in appropriate chemical solutions. It may be urged that the consideration of these problems does not properly fall within the prov. of the biologist, but their results, if not their investigation, are strictly relevant to the study of living matter. It has been estab. that living matter always consists of a complex substance or substances composed of carbon, nitrogen, hydrogen, and oxygen, with traces of other elements and about 70 per cent of water: the components of that primary form of living matter known as protoplasm. Further, living matter is

always in a state of physico-chemical change, i.e. it is constantly changing its chemical composition and at the same time liberating or storing energy. One type of change is the elaboration of chemical substances of more complex character with absorption of energy: whilst the complementary type of change involves the breaking down of complex into simpler substances with liberation of energy. The respiration of oxygen from air causes oxidation of complex substances with production of carbon dioxide, water, and other compounds and liberation of energy, with waste of tissues: whilst the utilisation of food results in reconstruction and storage of energy. The one process (katabolism) is waste and decay; the other (anabolism) is repair, renewal, growth, and storage. The two are included in the single term metabolism. The food taken in by most animal organisms consists of the protoplasm of plants and animals, whilst green plants have the power of building up from carbon dioxide, water, and mineral salts a number of substances, and ultimately protoplasm itself. The condition upon which life depends would seem to be the quantitative relation of anabolism to katabolism. If katabolism is in excess of anabolism, the organism is wasting and decaying; if the reverse, the organism is growing. Should the two exactly balance one another, then the organism is stable. Nothing comparable with this occurs in non-living matter. A crystal will grow if it be suspended in a saturated solution of matter similar to itself in structure, but there are striking differences between the growth of crystals and that of organisms. In the first place, the crystal will grow only at the expense of matter similar to itself, whilst plants grow through the utilisation of materials widely different from themselves, and even animals absorb materials different from that of which they are made up. Again, crystals grow only by accretion at the surface, while the growth of living matter is always a process of inter-susception between existing molecules in the cells. Further, all living matter decays and dies by resolving itself into products of oxidation, and the life processes can take place only under certain restricted conditions of moisture and temp. All living matter reveals, under the microscope, that its various parts differ chemically and physically; and in most living things these different parts are organised into organs and tissues visibly different. Even the simplest forms of life have the power of reacting to stimuli, which is termed *irritability*. Again, in its mode of propagation, living matter stands in sharp contradistinction to non-living matter; for all living matter is believed to derive from pre-existent living matter (biogenesis), a portion of which is detached and develops the same power of reproduction by means of div. Nothing is known in the realm of non-living matter which resembles these properties of living matter. These facts seem to imply a div. between the two,

but it is nevertheless by no means easy to distinguish simple forms of living matter with certainty from non-living matter, a difficulty well illustrated by the virus particles which cause such diseases as smallpox and measles, and which are still widely believed to lie on the boundary between the living and the non-living. The criterion may be, after all, not chemical composition, but power of adaptation and functioning. Although a great deal of progressing has lately been made in the direction of the synthesis of very complex compounds, chemists are still a long way from the synthesis of anything like protoplasm itself. The actual manuf. of protoplasm, were it achieved, would not necessarily mean that the problem had been solved—since some speculations proceed on the assumption that life is an entity, distinct from, though associated with, living matter, whilst others assume that once the organisation of matter assumes particular types of complexity, the matter is living. It has been suggested, for instance, that in the earth's earlier phases, under different temp. conditions, other forms of life existed, associated with chemical substances, perhaps as complex as protoplasm, but composed of different elements and with different physical properties—but nevertheless irritable, capable of adaptation, of reproduction, and of metabolism. Such speculations are based on the view that life and living matter are the same thing. On the other hand, all the 'creation' theories have held that life is something put into matter which, animated by this new principle, becomes living. Some modern vitalists hold what is, in essentials, a similar view, regarding life as an irreducible entity—something unique, which cannot be expressed or explained in terms of anything other than itself. It has a vital spark, Bergson's *élan vital*, which can never be imitated. Others—non-vitalists, materialists, etc.—hold that the entities which the chemist and the physicist consider are adequate to explain life, which is not a separate entity. All that can be said with certainty is that up to the present no success has been achieved as a result of attempts to produce living matter in the laboratories, and that we know of no way in which life is produced except as the result of the reproduction of pre-existing living beings.

Belief in spontaneous generation died hard. As early as 1660 Francesco Redi, of Florence, found that the maggots in decaying meat arose, not from the putrefaction, but from eggs laid on the meat by flies; and that if the meat were covered with a thin cloth, no maggots were found. Nevertheless he believed that gall-flies and intestinal worms were produced spontaneously. Buffon, Needham, and Lamarck (q.v.) believed that minute life-units were scattered through the universe, and that these spontaneously organised themselves into forms of life. Spallanzani showed that by boiling organic substances and enclosing them in air-tight vessels it was possible to prevent living

creatures from forming in them. But the greatest blow to the theories of a biogenesis, renewed by Pouchet (1800-72), was the series of experiments carried out by Louis Pasteur (1822-95) (q.v.). Charlton Bastian (1837-1915) was the only man of scientific eminence at that time who seriously questioned biogenesis.

Lord Kelvin (q.v.) suggested that life was brought to the earth by meteorites. Very recent evidence that bacteria can survive the high vacuum, tem., and radiation within an electron microscope strongly supports the suggestion that one part of the universe could 'seed' another. But, essentially, this merely alters a little the form of the question, from 'How did life originate on the earth?' to 'How



LORD KELVIN

did life originate in the universe?' Ray Lankester (q.v.) took the view that living matter was evolved from non-living matter by gradual stages, and that the first protoplasmic cells fed upon their ancestors. This view fits in well with the general theory of evolution. It assumes that at some time in the earth's hist. the conditions of temp., moisture, etc., were such as to allow the formation of highly complex chemical compounds. Some would break down immediately, whilst perhaps others would—owing to their capacity of being able to use other substances—tend to re-form as fast as they were disintegrated. The theory of the survival of the fittest is applied here. Those compounds best fitted to survive, on account of their metabolism—their capacity for maintaining a balance between growth and waste—would live on and gradually evolve into protoplasm. Huxley and Spencer were inclined to believe that biogenesis is now the rule, and that, in all probability, the actual conditions under which life was evolved in the past have disappeared, with no likelihood of re-appearance. It may be, of course, that

the conditions demanded for the development of life from inorganic materials are so complex, involving so many precisely adjusted factors, that the possibility of the situation occurring twice over on the earth is an incredibly remote one. Nevertheless the view is widely held that some form of vegetation, even if not of animal life, occurs on the planet Mars. At least one other star besides the sun has recently been shown to possess a solar system, so that on the ground of probability alone it is unlikely that our own planet is the only one where life is in existence. Perhaps, in so unique a situation, life began. In any case, however, the facts are little further advanced now than they were some years back, in spite of real advances in the field of biochemistry, and we can only say that the origin of life remains a mystery—all forms proceeding, as far as we know, from previous forms; and that we have no evidence that any form of life is being evolved from non-living material.

Embryology and reproduction. The simplest organisms never consist of more than 1 cell, which, after a time, divides into 2 parts, each containing a share of the cell substance, the nucleus and the nuclear contents. There has been a great deal of speculation why this should happen. In a single cell the power of responding to external stimuli and of taking in food are functions of the external surface, whilst the total needs of the organism are to be regarded as a function of the total bulk, i.e. of the volume. We may say that, generally speaking, anabolism is dependent upon the extent of surface, and katabolism upon volume; i.e. the one varies as the square of the radius and the other as the cube. There is thus, for every cell, an optimum bulk beyond which growth is difficult, and at this point, it is assumed, the cell safeguards itself by dividing into 2 smaller ones. Although, when such division has once occurred, the original cell no longer exists, its actual material is part of the new cells. In the simple forms of organisms, consisting of single cells, it is possible to say, therefore, that death never occurs; and that the cells, though not everlasting, are nevertheless immortal. In such forms of life there is no distinction between body and organs. All the functions of a living organism are performed by the one body, and though we speak of the unicellular organism as a simple form of life, physiologically it is very complex, since it performs all the varied functions of nutrition, reproduction, response to external stimuli, excretion, etc., itself. The form of reproduction which has been mentioned in connection with these organisms is known as asexual reproduction, or reproduction by simple fission. A slightly higher, though really hardly different method is that shown by some single cells, such as yeast, which bud off tiny portions of themselves which eventually become separate and grow approximately to the size of the parent cell. Another form of reproduction which can be observed with some unicellular animals results from

conjugation. Here 2 apparently similar cells unite into 1, and then divide to give rise to new individuals; as some nuclear material is exchanged, we have here the rudiments of the sexual process which reaches its highest development in the reproduction of the flowering plants and the mammals.

A higher stage of life is reached when a number of similar cells combine together to form a body. We thus have an organism made up of a number of cells (multicellular), and here we see differentiation, certain cells assuming one function preponderantly, and some another. Some cells take on the function of digestion and nutrition, some movement and some reproduction. At a still higher stage groups of cells become organised, for the purpose of carrying out in common a single function, into aggregates—the tissues; and eventually, in higher forms, tissue aggregates occur—the organs. In these higher forms of life the cell has split up into aggregates of cells of specialised structure, carrying out different functions, but nevertheless all have originated in a single cell, and unitedly they may be termed the organism or body. In the course of the development of the organism, differentiation is constantly going on, and 2 main directions may be distinguished. Some of the cells are differentiated into those which are destined to form the bodily tissues and to be concerned with the functions of nutrition, movement, and response; others are differentiated into the germ cells, which will undertake the function of reproduction. It is clear that for the persistence of the race the function of reproduction is of paramount importance. The reproductive cells are of 2 types, known as ova and sperms (sometimes called spermatozooids in plants and spermatozoa in animals). In dioecious plants and animals the sperms are carried by certain individuals called males, and the ova by others, termed females. Sometimes a single individual—hermaphrodite—carries both sperms and ova, but in such cases there are, frequently, elaborate mechanisms which ensure the impossibility of union occurring between ova and sperms derived from the same organism. Ova and sperms differ in structure and in function. Ova are normally quiescent and provisioned with nutriment for the nourishment of the embryo in the early stages of development, whilst sperms are smaller and more active, being provided, in many cases, with structures which enable them to swim about and make their way to the ovum. Sperms which do not unite with an ovum die; and so, in all but exceptional cases, do ova which fail to unite with a sperm. For reproduction to occur a sperm must penetrate an ovum. The nuclei of the two fuse, and the cell material of the sperm is absorbed into the cell material of the ovum. The resulting cell is known as a fertilised ovum, which begins to divide, forming first 2, then 4, 8, 16, etc., cells. In suitable conditions the fertilised ovum will give rise to millions of cells by

repeated division and subdivision. The cells produced by the fertilised ovum have, in very many cases, been observed to be differentiated, very early in div., into germ cells and somatic cells. No other cells, excepting the germ cells which are embedded in the reproductive organs till they take their part in reproduction, ever *unite* to produce a new organism. Somatic cells may increase their number by div., and it is possible for missing parts of organs to be renewed; they may also form new individuals by budding.

It should be remarked, in passing, that exceptionally it appears to be possible to fertilise an ovum without the aid of a sperm. The eggs laid by the virgin queen bee hatch into drones, and the green fly (*Aphis*) produces large numbers of young from unfertilised eggs. These are cases of parthenogenesis (virgin birth). Still more remarkable is the fact that the unfertilised ova of the sea-urchin may be made to commence development merely by immersing them in inorganic chemical solutions, and that the unfertilised ovum of the frog commences to develop when the egg is merely pricked. Recently a similar claim has been made for eggs of the rabbit (i.e. a mammal), which have been caused to develop as far as the adult stage without any process of natural fertilisation. Apart from the implication of parthenogenesis concerning the birth of Christ and other religious leaders, Spurway has recently calculated the chances of this phenomenon in humans as one in sev. millions, and has investigated one possible case. It has been urged that the function of the sperm is purely chemical or mechanical, and that it is not indispensable. But this statement is too sweeping. Geneticists have shown beyond doubt that the sperm carries half of the unit characters which will determine the attributes of the offspring. In some cases of parthenogenesis, observers have seen a part of the ovum, which is normally rejected before fertilisation, returning to the ovum and functioning as a sperm. Again, ova which have been stimulated to development by means of physical or chemical stimuli may not develop normally: even the carefully worked-out methods of Loeb (1859-1924) produced larvae which were not quite normal.

Closely related to the problems of fertilisation is the problem of death. Weismann regarded the mature organism as the mere guardian of germ cells destined for reproduction, and death as the nemesis of reproductive acts: once the germ cells had been brought to maturity and released in sufficient quantity to ensure the perpetuity of the race, the body was of no further use. Death, therefore, appeared to him inevitable. But it is clear that the matter cannot be allowed to rest at this point. If the germ cell is immortal, and the somatic cell is destined to perish, in what ultimate differences of structure or material does this difference lie? Unicellular organisms, as has already been said, are potentially immortal, and this quality is shared by germ cells. The

somatic cells are formed by the germ cells; by specialisation they lose their power of reproducing new individuals, though they may divide to produce other cells of their own specialised type. Death seems, then, to be involved in differentiation—the germ cell *may* die as a result of violence or disease or unfavourable conditions, but the body cell apparently *must* die in any event.

Perhaps the greatest generalisation in the field of embryology is the recapitulation theory. The embryologists of the earlier half of the 19th cent. had observed that there were interesting resemblances between the early embryonic forms of animals markedly different from each other at maturity. For example, the resemblances between the embryos of sharks and birds and dogs were obvious, in spite of the great differences between adult sharks and birds and dogs. Further, there were resemblances between the very young embryonic forms of creatures so widely different as worms, sea-urochins, frogs, and mammals. Development, that is to say, proceeds on parallel lines up to a point at which divergences begin to occur. These phenomena were not intelligible until the theory of evolution had been announced. Individual development then became intelligible as a recapitulation of the stages through which the race had passed in its evolution from a simple to a complex organism. Von Baer first enunciated this principle, which is generally named after him, though Haeckel later enunciated it in the form: ontogeny (the development of the individual) recapitulates phylogeny (the evolutionary hist. of the species to which that individual belongs). Further research has shown that often a great deal of omission occurs, and that other complications interfere with the accuracy of the detailed reproduction of the past; but nevertheless the general truth of von Baer's law is admitted. It has, however, been criticised recently by de Beer; the stages in development of the individual are held by him to recapitulate similar stages in the *embryo* of the ancestors, not in the adult form of their ancestors. The principle of Baer's law has been widely used in the fields of sociology, anthropology, etc., and, provided the application is not strained too far, it is capable of illuminating a great many problems. In B. it has been used in the effort to construct genealogical trees of existing species of animals and plants, and demonstrating their historical relationships. But it must be remembered that the evolutionary hist. of a single species extends over many millions of years, whilst the process of individual development is a matter of days or weeks, of months at most. Consequently it is impossible that the development of the embryo from the ovum can do more than retrace the main outlines of the development of the hist. of the race; details must necessarily be omitted, and short cuts often taken. There has been speculation why the ovum must develop into the mature adult by means of an often circuitous route, when

greater economy would be secured by more direct means. For example, in the developing human embryo gill slits appear as they do in the embryo of the shark and the chick. In the shark they are the basis of gills, but in the chick and the human being they simply close again. It has been suggested, however, that such structures provide the necessary stimuli for the development of the structures which subsequently replace them; and this view seems to be borne out by recent work dealing with the hormones, chemical substances generated within the organism and passed into the blood-stream to activate other parts of the body. It seems likely that structures arising in the course of development and disappearing before development is complete may function in this particular way, giving rise to substances necessary for the development of other parts. It has been found that the total removal of embryonic structures interferes very definitely with proper development, whilst their transplantation to other parts of the embryo has quite other effects. Work in this particular field of research is still being carried on at present. In fact, biologists are coming more to appreciate that purely embryonic structures are essential in promoting their successors, and may have vital secretory functions where they survive, apparently uselessly into adult life.

Darwinism and humanity. The simplicity of the Darwinian formula proved misleading to a great many people. It was conceived that the Darwinian theory implied that human beings were mere creatures of environment, and that, through modification of the environment, the aims of philanthropists and social reformers might be achieved. The expression of these ideas has again been found in very recent pubs. of biologists in Soviet Russia (see Lyseuko). It is not necessary to deal with the literature which grew up from confusing the 'fittest to survive' with the morally best, or with ideas based on the unjustified simplification of a theory which was already oversimplified. The real issue is that the relationship between the organism and its environment is excessively complex and that the two together make a totality in which the environment can present a vast array of variable factors to the organism, while the organism can react in a great many ways. The analysis of this situation, which is the modern science of ethnology or 'animal behaviour,' is in its infancy, and stands very close indeed to psychology. Since Malthus (1766-1834) first pointed out that the pop. increases at a faster rate than the means of subsistence, nothing in the way of the improvement of agriculture, the opening up of new lands or the discovery of new supplies of food has refuted Darwin's observation that far more individuals of every species, including humans, are born than can survive.

The experimental studies of heredity and variation belong, in the main, to the 20th cent. Galton (1822-1911) realised

that the question of the tendency of parents to transmit their characteristics to their offspring must be investigated, in part, at least, by a statistical method. Mendel, it will be remembered, working earlier and independently, had arrived at the same conclusion. The difficulties of individual investigation of human heredity were largely caused by the fact that there was no precise knowledge of the hist. of the feature the inheritance of which was being investigated no matter how thoroughly that feature was known in the individual. Galton's contribution to biological knowledge lies not so much in his actual theories of heredity, as in his discovery of a method which Morgan, Blakeslee, and Kiddell have since used successfully.

Evolution and behaviour. If environment is regarded as the means of making explicit what is implicit in the individual (e.g. the capacity to eat is expressed as behaviour only in the presence of an edible object), variations may be looked upon as being partly inherited and partly acquired. Structures which may be used in certain ways are inherited, but modes of using them are acquired. The environment, though it may stimulate certain organisms to act in certain ways, cannot possibly do so in the case of others. Tempting food at the top of a tree may cause a monkey to climb the tree or a bird to fly to it, may stimulate a dog to frantic and futile efforts: it cannot, however, make the dog, whose limbs are unfitted for climbing, climb. The cause of the effort, in all these cases, is a relation between the animal and the food. If the animal were indifferent to the food, the possession of suitable climbing structures would not induce it to climb the tree. Some such line of criticism as this must be applied to the experiments of Weismann and his followers to show by the mutilation of successive generations of rats and mice that acquired characters were not transmitted. There was no innate tendency towards taillessness in these animals, and Weismann's attempts to stimulate something which did not exist came to nothing. From results of experiments made by Kammerer, Sumner, and other workers, Neo-Lamarckians believe there is no longer any room for doubt that some acquired characters are transmitted, and the question to be solved has thus become that of which characters are so transmitted, in what ways and to what extent. It has been pointed out that the results of education are not transmitted in human beings; on the other hand, men vary in their capacity to be educ., so that we may postulate a hypothetical variation, 'educability.' It is not possible to define and measure it in men, and, further, the interval between successive generations makes man an unsuitable subject for experiment of this kind. Wm McDougall, however, conceived the possibility of educating rats, by training them to learn how to interpret signals which lead them to food, failure to follow the proper signals resulting in punishment

by means of a mild electric shock. It is possible here to estimate the speed at which the rats learn by counting the number of trials necessary before the rat has learnt how to reach the food without making mistakes. If the same experiment is repeated through a number of generations, evidence will have been accumulated which will indicate whether the results of training are transmitted to later generations in the form of an increased facility to learn. McDougall (1931) pub. an interim report in which he claimed he had evidence that this was the case, but which has not so far been confirmed.

Basis of genetical change. One of the conclusions from the experiments of Mendel and his successors is that no individual possesses characters which have not been transmitted to him, even though in his individual existence he may develop and use them in ways which are different from those in which his parents made use of them. Thus, if we believe that the Alsatian sheepdog, the bulldog, and the spaniel are descended from a single race of dogs, we must believe that the members of that race possessed the characters which we find, in exaggerated form, perhaps, in their descendants. The origin of all the domestic races of plants and animals is accounted for by the view that selective breeding has resulted in the weakening or loss of factors which were present in the ancestors; and the view is confirmed by such experiments as those of Darwin, who succeeded in breeding the wild rock-pigeon by crossing extreme domestic varieties, or the reproduction of the colour of the wild rabbit by the crossing of a yellow rabbit with a Himalayan variety. In such ways we bring together the factors which have been segregated in the domestic strains. It is not possible to say what these factors are, but they seem not to be corpuscles of living matter, as Darwin and Weismann held. They may be definite chemical compounds which, entering the cell, influence metabolism, and so determine development. Of mutations and their origin little is known except that they occur, and to say that they are 'spontaneous' is merely to admit ignorance of their cause. Darwin held that great and sudden changes in environment increase variability. This appears to be true of *Drosophila* when kept under laboratory conditions; the rate of mutation has been greatly increased by subjecting this insect to X-rays. Consequent on the exposure of animals to various forms of radiation produced in atomic research, and the discovery that the mutants so produced may actually have broken or malformed chromosomes, it is now believed that the cosmic rays (q.v.) constantly falling on the earth, may be a primary cause of 'spontaneous' change and hence of evolutionary mechanism. Similar effects are produced by a group of chemical compounds, the mustard oils. At the same time it must be pointed out that remarkable differences in the form of the adult can be produced by varying the conditions of, for example,

temp. or illumination, during the larval life of animals such as insects. The subsequent transmission of these characters to the offspring raises the question as to whether the environment has merely released selectively a potential in the organism, or whether it has produced a permanent change in the inheritance mechanism. Very recent research indicates that some characters of this kind can be transmitted directly from mother to offspring by a chemical mechanism (somatic inheritance) particularly where, for example, the environment to which one generation is subjected appears to determine whether or not its offspring shall be hibernating and over-wintering forms.

Place of Biology among the sciences. It is evident that B. considers all matters which throw light on the relationship of life to matter. It touches very closely, at its higher stages, the physical and the mental sciences. The study of morphology or physiology in the light of the cell theory leads to consideration of protoplasm, and it is the endeavour of some biologists to reduce this to chemical and physical formulae. Whether this be possible or not, it is clear that living matter responds in a variety of important ways to physical and chemical stimuli, and the relation of B. to chem. and physics has resulted in the development of special branches of investigation under the names of biochemistry and biophysics. Again, the statistical methods of certain branches of biological research depend upon mathematics. Psychology, too, stands in close relation to B.: if the psychologist turns to B. for definitions of environment, organism, instinct, and the like, it is no less true that the biologist uses terms borrowed from the psychologist in his descriptions of animal behaviour. The science of sociology, too, though it is the study of social aggregates, and must study the individual for the purpose of accumulating data, has to make use of concepts borrowed from B. The studies of social and physical anthropology, also, are related to B.

Applications of Biology. Although B. is pursued purely as a branch of science, as a contemplation of, and an effort to comprehend the world of life and man's place in it, it is proving itself of utilitarian value. From the first it has stood in definite relation to medicine, the earliest botany being connected with the gathering and cultivation of plants of medicinal value. At the present day pharmaceutical research is directed towards the discovery of new remedial agents in plants and methods of extraction. The discovery and preparation of vaccines, anti-toxins, and medicinal preparations from the glands of animals is a definite application of B. to medicine. Again, the study of many diseases showed that they owed their origin to the presence of living organisms which lived either within the body (parasitic worms, protozoa, germs of various kinds, etc.) or upon it (various blood-sucking insects, etc.). The development of successful procedures

against the disease demanded study by competent biologists of the hist. of the organism causing the disease. Studies of this kind have made it possible to banish certain diseases—malaria, yellow fever, sleeping sickness, relapsing fever—from areas in which they had formerly been prevalent. Despite the production of insecticides, and of plant hormones, both to promote growth and to eradicate weeds, which have virtually become biological industries, it is certain that a study of the entire B. of pests, including their natural enemies, food requirements, and other environmental relationships, is essential. This is instanced in the classical work of Ross, who showed by detailed investigation of the mosquito in the field, exactly what changes in the environment would cause the disappearance of malaria which the insect carries. See APPLIED BIOLOGY.

While the production of new strains of animals and plants by selective breeding has increased the yields obtained, and extended the ranges of climate in which they can be raised, and while agric. stock has been improved by the introduction of artificial insemination (q.v.), making the best strains of animal available to all classes of breeder, the direct application of genetics to agriculture is still a remote possibility, and workers now are effectively operating as selectors of the fittest, just as agriculturalists have for hundreds of years. The lessons learned by the introduction of a foreign animal or plant into new terra, as instanced by the rabbit and prickly pear in Australia, and the changes in a complex pop. caused by the indiscriminate use of insecticides, favouring the appearance of other and often more harmful pests, has led to an entirely new aspect of applied B. It is now a recognised part of agric. research, pest control, etc., that a team of botanists, entomologists, who are ecologists (i.e. studying the relationships of animals and plants in the field), backed up by purer morphologists, physiologists, and statisticians in laboratories, is essential to any operation which might lead to unforeseen disturbances of the balance of nature with perhaps disastrous results. Modern surgery likewise owes much to work originating as physiology in B., where much of the pioneer work and development is carried out on animals other than man (see BACTERIOLOGY AND ANTISEPTICS).

In conclusion one could speculate on the application of B. and in particular genetics to the field of eugenics. The possibilities of, for example, preventing the reproduction of human beings with undesirable variations which are likely to transmit to offspring, e.g. feeble-mindedness, is of great interest, and likewise the alarming tendency in highly civilised communities for the birth-rate to be lowest amongst the best types, and highest amongst the poorest. But the ethical and political problems involved must mean that the application of B. towards the improvement of the race must remain a theoretical consideration at least in the sense that the application of biological knowledge in agriculture,

hygiene, and medicine favours survival, the broad principle of Darwinism, and the high ideals of eugenics may yet combine with rich results. See ANTHROPOLOGY; APPLIED BIOLOGY; EVOLUTION; MAN.

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Biology, Marine, see MARINE.

Biometry, literally, the science of measurement as applied to living things. B. concerns itself with the analysis, particularly by statistical methods, of the variation (q.v.) in living material, of pop. problems, and of the frequency with which phenomena occur in living material.

Bion, Gk scientist, belonged to the family of Democritus. He lived at Abdera, and was famous as a mathematician. It was said that he taught the existence of countries where the year is composed of a day and a night.

Bion, Gk bucolic poet, of whose life no record is known to exist. He was b. Smyrna, or near by, and he lived perhaps c. 100 BC, probably in Sicily or Magna Græcia. A few only of his poems have been preserved, among which the *Lament for Adonis* is the best known. According to Moschus's *Lament for Bion*, B. d. by poison. See U. von Wilamowitz-Moellendorf, *Bucolici Græci*, 1910.

Bion of Borysthene (c. 274-c. 241 BC), Gk philosopher and moralist. As a youth

B. was sold into slavery, but was afterwards freed and made the heir of his master, a rhetorician. He studied at Athens, subsequently taught philosophy at Rhodes, and d. at Chalcis in Euboea. A typical product of his age, half philosopher and half *littérateur*, B. was a member of the literary *salon* at the court of Antigonus Gonatas. Fragments of his work have survived; but his influence may be traced in the Satires of Menippus. Cf. Horace, *Epistles*, ii. 2. 60. His life was written by Diogenes Laërtius.

Biondi, Giovanni Francesco (1572-1644), It. writer, b. Lesina, one of the Dalmatian is. Introduced to the court of James I, he won the king's confidence, and later a title. He wrote a *History of the Wars of the Roses* in Italian, and d. in Bern. He was noted for the elegance of his prose.

Biometrics, or laws of life, that branch of biological research which deals with the relations of organisms amongst themselves and to their environment. It thus includes the study of heredity (q.v.), or the tendency of growing organisms to develop a symmetrical arrangement of parts which is characteristic of the species. How this tendency is transmitted is an old and still unsolved problem, though the researches of the followers of Mendel (q.v.) are suggestive. The development of parental characteristics is dependent upon the maintenance of certain conditions in the earliest or pre-natal stages of growth, and these conditions are investigated and generalised in the study of embryology (q.v.). Finally, the species being looked upon as one link in the whole chain of organic life, it is necessary to study how certain structures are affected by the laws of variation (q.v.), which have been directed by the tendencies studied under the name of evolution (q.v.).

Biophysics, investigation of the properties of living material and its products, by the techniques of physical science. Though considerably less advanced than its sister science, biochemistry (q.v.), B. is producing information of great theoretical and practical value. Biology analyses organisms into organs, tissues, and eventually cells (q.v.), but further sub-div. produces portions of material not independently capable of life. This is the boundary at which B. begins.

Amongst knowledge obtained through B. we have information on the molecular structure of muscle, skeletal tissues, and the crystalline viruses by X-ray and electron diffraction techniques; the interpretation of electrical phenomena associated with nerves (q.v.) and with membranes through which the differential transport of chemicals takes place; the causes of the unique physical properties of protoplasm, such as its surface tension, viscosity, and permeability.

Biot, Jean Baptiste (1774-1862), physicist, b. Paris. He was educ. in the polytechnic school, after which he entered the artillery service. The latter he soon left in order to study natural science and mathematics. He taught physics for some years at Beauvais, after which he

became prof. of the same subject in the Collège de France. In 1803 he was elected a member of the Academy of Sciences, and a year later he was appointed to the Observatory of Paris. In 1806 he was made a member of the Bureau des Longitudes, and in 1809 became also prof. of physical astronomy in the univ. of Paris. He pub. sev. excellent textbooks; among them may be mentioned *Essai de géométrie analytique* and *Traité élémentaire de physique expérimentale*, etc. He also wrote books on the astronomy of the ancients, Egyptians, Chinese, and Indians. Nearly all branches of physics were advanced by his labours, and he was specially celebrated for his discovery of the circular polarisation of light; he invented a polariscope to show polarisation by reflection. He was one of the more eminent physicists and mathematicians of his time. He d. in Paris.

Biotite, mineral of the mica group. It is a silicate of aluminium and iron with magnesium and potassium. It crystallises into hexagonal prisms. It is often called magnesia mica, as distinct from muscovite or potash mica. The most important variety of B. is meroxene, which is found in volcanic deposits. It was from fine crystals of this variety, found near Vesuvius, that mineralogists were able to determine the crystalline form of mica, which was formerly thought to belong to the hexagonal or orthorhombic systems. Other varieties of B. are rubellene, found in many volcanic rocks, vogtite, found in gravel rocks, phlogopite, which has a large proportion of silica, and lepidomelane, which is rich in ferrous and ferric oxides. When ferrous oxide quite replaces magnesia, iron mica results. B. mica is more readily decomposed than muscovite.

Bipinnaria (Lat. *bis*, twice; *penna*, a feather), name given to the larva of a starfish. Its shape is peculiar, and has a tendency to develop long 'arms.' The two ciliated bands, which at first enclose the larva, gradually extend themselves till they enclose nearly the whole of the upper and lower halves of the body.

Biquadratic (Lat. *biquadratus*, twice squared), an equation which involves the fourth power of the unknown quantity, e.g. $x^4 + ax^3 + bx^2 + cx + d = 0$, where x is unknown.

Bira, see BEEROTH.

Birch, Charles Bell (1832-93), sculptor, b. London, the son of Jonathan B. (1783-1847), the translator of *Faust* and the *Nibelungenlied*. He was a pupil at the school of design, Somerset House, afterwards studied in Berlin and at the Royal Academy and was assistant to Foley (q.v.). He won £600 in 1864 from the Art Union of London by his life-sized group 'A Wood Nymph.' He became an A.R.A. in 1880, and in that year his most conspicuous work the Griffin, on the Temple Bar memorial in Fleet Street, was accomplished.

Birch, Samuel (1757-1841), dramatist, b. London. He was the son of a pastry-cook in Cornhill. He himself was a pastrycook, the proprietor of 'Birch's,'

the oldest shop of the kind in London. In 1815 he became lord mayor. He wrote numerous musical dramas and poems, including *The Adopted Child*, *The Smugglers*, *The Manners*, *Fast Asleep*, and *A Victim of Romance*.

Birch, Samuel (1813-85), antiquary and Egyptologist, b. London. He was educ. at Merchant Taylors' School. In 1861 he was appointed to the keepership of the antiquities dept. of the Brit. Museum. In 1874 he became president of the London Congress of Orientalists. He trans. many hieroglyphical works, and compiled Egyptian grammars.

Birch, Thomas (1705-66), historical writer, b. of Quaker parents in London. He qualified himself for the ministry, and entered the Church of England. In 1734 he became chaplain to the Earl of Kilmarnock, and rector of St Margaret Patten in 1746. In 1735 he became a fellow of the Society of Antiquaries and of the Royal Society. He did a considerable amount of literary work, compiling and editing. He also transcribed a great number of works in the library at Lambeth Palace.

Birch (*Betula*), tree or shrub belonging to the family Betulaceae. There are about 40 species of B., and while the majority are trees of medium size, some are shrubs. B. trees are to be found in nearly every country of the N. temperate regions, and in the Arctic. The trunks are round, with slim branches, and the bark is generally in fine, soft, membranous layers. The common B. (*B. pendula*) is a graceful tree, silvery white in colour. It grows quickly, but does not live long. It is found in the forests throughout the greater part of Europe, particularly in Russia, and also in Asia Minor and N. America. The prin. use for B. in Scandinavia, Russia, and Canada is for cutting into veneers for the manuf. of plywood. Thousands of spoons, used in Russia, are made from it. The bark and also the leaves are utilised medicinally, and for dyeing and tanning; the Russian leather is noticeable for the odour caused by the B. tanning. In N. America the B. tree is as useful. The wood is tough and durable, and is made into canoes, snowshoes, platters, and also used for house roofing. There are sev. kinds of B. in N. America; the white is used in the last-mentioned ways. The black B. (*B. nigra*) and the red B. (*B. lenta*) are other varieties of which the wood is exceptionally hard; hence their value. The leaves may be used for making tea, which has an agreeable flavour. The yellow B. (*B. lutea*) of Nova Scotia is another species, and the paper B. (*B. papyrifera*) is so called because the bark can be thinly peeled into sheets and used in the place of paper. B. oil is manuf. from the outer layers of the bark, and mixed with a fine meal it forms food for pigs. In early spring, when the sap is just beginning to rise, it is drawn from the trunk, and on account of its sugary nature is manuf. into a kind of vinegar. The weeping B. (*B. pendula* var. *youngii*) is another variety. The dwarf B., a very low shrub, is found almost every-



where in the N. part of the world. The Laplanders used it in stuffing their beds, for fuel, and the seeds for food. See FORESTRY and TIMBER.

Birch-Pfeiffer, Charlotte (1800-68), Ger. actress and dramatist, b. Stuttgart. She began to act at Munich at the age of 13, and from that time she played at Berlin, Hamburg, and other places. In 1825 she married Dr Christian Birch of Copenhagen. She played afterwards in Amsterdam, St Petersburg, and Pest. From 1837 to 1843 she was sole manageress of the Zürich theatre, and took to writing plays. She won more popularity for her play-writing than for her acting, though her works reached no very high standard. She dramatised *Jane Eyre*, and her works, mostly adaptations of novels, were pub. in 23 vols. at Leipzig.

Birchington, seaside resort in the Isle of Thanet, Kent, England, 2 m. from Margate and 71 m. from London by rail. Dante Gabriel Rossetti (q.v.) d. and was buried here. There is a good golf-course; the beach is of tide-washed sand. Pop. 4000.

Bird, Edward (1772-1819), genre painter, b. Wolverhampton, where for some years he was engaged in designing for japanware. In 1809 his 'Good News' was accepted by the Academy, and his reputation became estab. He came under the patronage of Princess Charlotte, and in 1815 was elected R.A. Well-known paintings of his are 'The Country Auction,' 'Village Politicians,' 'Blacksmith's Shop,' 'The Field of Chevy Chase.'

Bird, John (c. 1709-76), mathematical instrument maker and mechanic of London. He pub. a work entitled *The Method of dividing Astronomical Instruments*. See HOROLOGY.

Bird, Robert Montgomery (1804-54), Amer. author, b. Newcastle, Delaware. He began his career as a dramatist, achieving his greatest success with *The Gladiator*, 1831. This was followed by *Oralloosa*, 1832, and *The Broker of Bogota*.

Turning to fiction, he pub. *Calavar*, 1834, and its sequel *The Infidel*, 1835. The best of his novels was *Nick of the Woods*, 1837. See life by C. E. Foust, 1919.

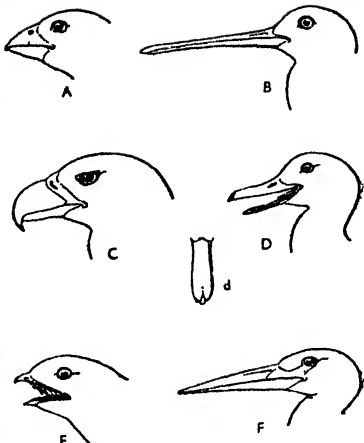
Bird, warm-blooded, feather-bearing, egg-laying, amniotic (see AMNION) vertebrate, with the fore-limbs modified into wings. Metacarpus and fingers carrying feathers or quills. With an intertarsal joint. Not more than 4 toes, of which the first is a hallux. This transformation of the fore-limbs of B.s into feathered wings is of the greatest importance, and the modification of the internal structure arising from it forms the basis of classification of this group of animals known as Aves. The wing consists of the typical parts of a fore-limb, the humerus, radius, and ulna, carpus, metacarpus, and digits. The first digit is the *pollex*, or thumb, to which some feathers, known as *ala spuria*, or bastard wing, are attached; the second digit is the *index*, which bears the large feathers known as the *primaries* or *manuels*, usually 10 in number. The primary feathers, with the *secondaries* or *cubitals*, which are attached to the ulna, form the large wing-quills, called *remiges*, which are used in flight. The sternum, or breast-bone, of B.s is affected by their powers of flight: those B.s which are able to fly have a carina, or keel, projecting from the sternum, and serving as the basis of attachment of the great pectoral muscles used in flight. When the B.s are incapable of flight the keel is absent or greatly reduced. The vertebral column is completed in the caudal region by a flat plate known as the pygostyle, which forms a support for the rectrices, or steering tail-feathers, and for the uropygial gland (see below). The legs are composed of a femur, tibia, and fibula, and the bones of the foot; the feet have often 4 toes, but in many cases there are only 3. The proximal tarsal bones are fused with the tibia, and the distal tarsals are joined to the metatarsals; between the 2 sets is the intertarsal joint already mentioned. In swimming-birds the legs are placed well back, while in those which have an upright carriage the balance of the body is preserved by the forward position of the legs. No existing species of B.s possesses teeth. The uropygial gland borne on the pygostyle is an oil-gland used by B.s in preening their feathers, for their skin is unprovided with sebaceous glands. The eyes are furnished not only with an upper and a lower eyelid, but also with a nictitating membrane, semi-transparent, and covering the eye at the volition of the owner. The vascular system contains warm blood, which is kept usually at a higher temp. than that of mammals; death from cold is rare unless allied with torpidity and starvation. The aortic arch is on the right side of a B., whereas in a mammal it is on the left. The respiratory system is curious, as the lungs themselves are small and are prolonged into air-sacs with which are connected a number of air-spaces in the bones. These air-spaces are found in the species which are powerful flyers and require the lessening of bodily weight, but in young B.s, small B.s,

aquatic and terrestria B.s they are not so highly developed; in addition they increase the efficiency of the respiratory system. The organ of voice is not the larynx, but usually the *syrix*, a peculiarity of this class formed at the bifurcation of the trachea, and the modulations are effected by adjoining muscles. The heart of a B. is enclosed by pericardium, and consists of a right and a left half; there is no diaphragm between the thoracic and abdominal regions. Digestion takes place in the oesophagus, stomach, and intestines, but it is a highly specialised function. The tongue is the first organ to aid in digestion, then comes the oesophagus, and this has frequently a dilatation known as the crop in which the food is softened; the food then passes into the stomach, in the front part of which, the *proventriculus*, the process is carried on further; then follows the gizzard, or *ventriculus*, which contains small stones and gritty matter for the grinding of the food, especially noticeable in such B.s as feed on seeds and grain. The duties of building a nest and hatching the young cannot be definitely assigned to either the male or the female B. It is customary for the male to provide the material and for his partner to perform the architectural work, but in many cases the female provides her own material. It usually falls to her lot also to do the sitting, but there are cases in which the pair takes this in turn, and other cases in which it is performed by the male alone. The cuckoo neither builds a nest nor rears its own young, but places the eggs in the nest of another bird and leaves the foster-mother to care for them. The position which Aves hold in the animal kingdom is higher than that of Reptilia, and lower than that of Mammalia; with the former class they have great affinity, but few links have been discovered to trace the transition from one to the other. The discovery of the oldest B. known, the fossil *Archaeopteryx*, has been of great value in such research. There is a resemblance in the generative organs and oviparous condition of both classes, but B.s are never viviparous. The scales of reptiles may be compared with the feathers of B.s, but the blood of the Reptilia is cold while the blood of Aves is warm. In the development of brain, memory, and sight the lower class compares unfavourably with the higher, but the chief difference between the two lies in the adaptation of the B.s fore-limbs to flight. This adaptation, as well as a keeled sternum, is to be found in the reptilian Pterodactyl, but in the absence of feathers and in the general structure of the skeleton this fossil differs greatly from a B. Among mammals the bat is also able to fly, but the specialised structures by which it accomplishes this feat are entirely different from those found in Aves.

The main reptilian features of *Archaeopteryx* are the presence of teeth, the well-marked tail, with many separate vertebrae, and the claws on the wing-digits (claws also occur in the embryo ostrich). This bird is found fossilised in sandstone

of the Upper Jurassic period at Solenhofen (Bavaria).

In the classification of B.s. zoologists are agreed in dividing them into two unequal orders, the Archaeornithes, or primitive B.s., which includes the single genus *Archaeopteryx*, and Neornithes or modern B.s., which is sev. times subdivided, at first into 3 sub-orders known as Ratitae, Odontolcae, and Carinatae. The Ratitae receive their name from the resemblance of their breastbone to a flat-bottomed boat; they are flightless B.s., with reduced wings, and include, in addition to extinct species, e.g. the moa, living B.s., such as the ostrich, rheas, cassowary, emu, and kiwi, or apteryx. The Odontolcae are extinct marine flightless B.s. with teeth in grooves in the jaws and no keeled breastbone; an example is the genus *Hesperornis*. The Carinatae is much the largest sub-order of B.s., comprising thousands of species. It receives its name from the resemblance of the sternum to a keel, but in sev. flightless forms, as the extinct dodo and the living parrot, genus *Strigops*, this keel is absent or greatly reduced. The main orders are as follows. The Colymbiformes, or swimmers, consists of divers and grebes, all of which are water B.s. with webbed or lobed feet, upright bodies, and short tail-feathers. The Sphenisciformes, or penguins, are flightless marine B.s. covered with feathers, having the wings without large quill-feathers and using them as paddles when in the water; they are confined to the Antarctic. The Procellariiformes, or petrels, are marine B.s. with webbed feet and capable of powerful flight; the albatross and Mother Carey's chicken belong to this group. The Ciconiiformes, or stork-like B.s., have feet adapted for wading, and inhabit marshes as well as the sea, and inland ponds, e.g. the gannet, tropic B., cormorant, heron, bittern, stork, ibis, spoonbill, and flamingo. The Anseriformes, or goose-like B.s., are aquatic and include all geese, swans, ducks, and screamers. The Falconiformes are B.s. of prey with strongly clawed toes and curved beaks, as the hawk, vulture, eagle, kite, buzzard, falcon, and osprey. The Galliformes, or fowl-like B.s., run along the ground, e.g. the brush turkey, curassow, peacock, pheasant, domestic fowl, turkey, grouse, partridge, and quail. The Gruiformes, or crane-like B.s., include the water hen, rail, coot, trumpeter, and bustard. Five groups are placed in the Charadriiformes, or plover-like B.s., which vary in habit; some can both fly and wade, as the plover, oyster-catcher, avocet, curlew, and snipe; some can swim as well as fly, e.g. the gull, tern, auk, and puffin; others, as the sand grouse, inhabit deserts; while others again are land B.s. feeding on grain and seeds, e.g. the pigeon, dove, and dodo. The Cuculiformes, or cuckoo-like B.s., are arboreal. The parrots are placed in a separate order, Psittaciformes. Representatives of the Coraciiformes, or raven-like B.s., are the kingfisher, hoopoe, bee-eater, roller, hornbill, etc. The last, and largest, tribe is that



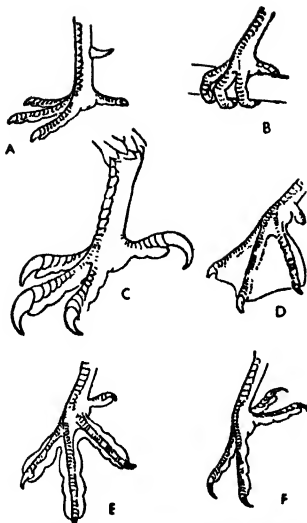
SOME TYPICAL HEADS OF BIRDS

A, Seed-eating bird. B, One which seeks food in soft mud. C, Eagle. D, Duck. E, Bird with wide gape which catches insects on wing, e.g. Swallow, Nightjar. F, Heron.

of the Passeriformes, or sparrow-like B.s., all of which are perchers and have few variations of internal structure. To them belong the broadbill, cock of the rock, lyre B., bush-shrike, lark, wagtail, flycatcher, thrush, wren, swallow, butcher-B., tit, B. of paradise, rook, starling, weaver-B., Amer. oriole, crossbill, and finch.

In most countries to-day official protection is given to B.s., but more particularly to B.s. useful in agriculture, such as those that counteract the too rapid spread of injurious insects, slugs, snails, mice, and voles. Again, cruelty to captive or domestic B.s. is an offence punishable by fine or imprisonment, and cruelty to wild B.s. is also punishable. There is a Wild Birds Protection Act which prohibits shooting or snaring certain B.s. during close seasons. Bird sanctuaries exist in most countries of Europe and in the U.S.A. These are places set apart for wild B.s. and, in England, the best known is that in Hyde Park. There are others in the royal parks and on the N. coast of Norfolk at Blakeney and Cley next the Sea.

Birds of various countries. Countries especially rich in B. life are Australia and New Guinea; Brazil and other parts of S. America, including the Falkland Is.; Mexico; tropical and sub-tropical Africa; and India. Australia's B. life is particularly rich in song B.s. and not a few Australian B.s. have aroused curiosity in the past, if not in the present day. There are wonderful cockatoos, brilliant-plumaged honey-eaters, emus, lyre-B.s., master mocking-B.s., etc. Notable, too,



SOME TYPICAL FEET OF BIRDS

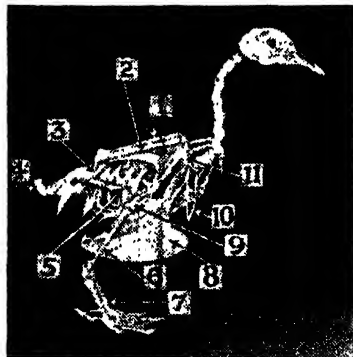
A, Bird that passes much of its life on the ground, e.g. Fowl. B, Percher. C, Hawk, Eagle. D, Duck. E, Coot. F, Woodpecker.

are the mound-builders or mallee hens and scrub turkeys, of which the former are remarkable for the fact that they do not brood on their eggs, but construct natural incubators filled with decomposing vegetation, which generates the heat necessary for hatching. Other Australian B.s are the wedge-tailed eagle, the fish-hawk of N. Australia (see OSPREY), numerous species of pigeons—bronzewing, wonga, topknot, and crested being among the most beautiful; the blue wren, the masked wood swallow, and the 'summer bird' or black-faced cuckoo. In the Amazon valley the numerous varieties of B.s provide many of the most brilliant plumage; but it is a very rare thing in a Brazilian forest to hear B.s singing, and nature's artistic energies would seem to have been concentrated in the production of beauty for its own sake. In the place of melodious songsters of more temperate climates are harsh-shrieking parrots and toucans; dry chatters such as the jay, and black and yellow hangnest; melancholy wallers, like doves and goat-suckers. There are, however, some little songsters known as 'dancers' which are the size of tom-tits, with blue plumage, red topknots, and black 'points'. The jacutinga, found in enormous numbers in the middle part of the Ivahy valley, is a species of penguin, in size and appearance something between the turkey and the pheasant. A B. of a different kind is the

suruquá, which is the size of a thrush, and with the exception of some of the humming B.s, by far the loveliest Brazilian forest B. The plumage of the male B. is resplendent purple and gold on the head, throat, and back, the breast a lovely bullfinch red, and the wings dark slate, varied with delicate white bars. Peru is also rich in B. life, notably in guano-producing species, such as the palm-peds, gaviots, and alcatraz, which at times are to be seen flying in myriads like a darkening cloud low down on the waters. Millions of cormorants, too, haunt these silent expanses of coast; scarlet-feathered flamingoes inhabit the upland lakes, and other wild fowl, some of edible value. Of the other S. Amer. countries, Venezuela boasts the scarlet ibis, eagles, and herons; Chile has but few B.s, and nearly all of sombre plumage, such as hawks, a species of turkey-buzzard, and also the condor. The wild turkey of Mexico was the progenitor of the domestic B. which that country gave to Europe; the zensontl or mocking-B., the humming B., the sopilote or buzzard—known as the scavenger of the plains and cities—the mournful tecolote or night-owl, and the quetzal, of rare and wonderful plumage, are among the best known of the other B.s of Mexico. The Falkland Is. are a rare haunt of B.s. Frequent violent gales at migration time add to the numbers of the occasional B. visitors, and these numbers are enhanced during the severe droughts that periodically recur in S. America. Among the most frequent visitors and indigenous species are the violet-eared dove; red-gartered and other kinds of coot; various kinds of grebe; the crane; the penguin—including the king, gentoo, ringed, or Antarctic, jackdaw, macaroni, and rock-hopper. The ringed penguin is very common in the S. Orkneys and S. Shetlands. These and the mollymawks are characteristic features. Also there are innumerable species of petrel—notably Wilson's storm petrel—one of the most numerous species of B. in the whole world, the water here being at times literally black with them. Other B.s of these waters are the wandering, the black-browed, the yellow-nosed, and the sooty albatross; terns; gull; sandpiper; plover; Chilean flamingo; spoonbill; heron; teal; pintail; vulture; snipe; and geese of various kinds. The S. Atlantic penguin differs slightly from the Antarctic. The 'emperor' of the cold regions is the most beautiful of the whole penguin tribe; the 'adelle' is much smaller. The African penguin, sometimes called by the natives the laughing jackass, is a very useful B. commercially—a fact which would not be true of the Antarctic varieties. Another notable African B. is the gannet of the Malagasy, or, as the natives name these birds, the Malagases, so called because the B.s congregate in thousands on these Is. It may be observed here that in most B.s the nostrils are on each side of the beak; but in the gannet there is no nostril on the outside, but immediately under the skin on each side of the head close to the eye

there is a system of air-cells, and as the B. breathes inwards the cells on each side of the head are inflated with the air which the B. can exhale at will. There is a much smaller species of gannet, the solan goose, *Sula bassana*, which nests in various places round the coasts of Britain.

The African continent, particularly W. Africa, possesses a very varied B. life. There are the great crested grebe; storm petrels and shearwaters; tropic B.s—not unlike large terns but for their long central tail feathers, 15–26 in. long; red-footed and brown boobies; cormorant;



F. Whitwam Jones

SKELETON OF A BIRD (PIGEON)

1, radius of wing, with the ulna below and alongside it. 2, humerus. 3, pelvic girdle. 4, the pygostyle or ploughshare bone, supporting the tail feathers. 5, femur of hind limb. 6, tibia. 7, tarso-metatarsus. 8, the keel of the sternum, to which are attached the pectoral muscles moving the wings. 9, bones (phalanges) of second and third digits of wing. 10, clavicle. 11, bone (phalanx) of first digit, to which is attached the bastard wing.

shag or reed duiker; darter or snake-B.—somewhat like the Brit. or African white-headed cormorant; frigate-B.s which wander from Boa Vista, Cape Verde Is., to the W. African coast; pelicans—white, pink-backed, etc.; heron—W. African reef, black-headed, purple, Goliath; squacco; white-crested bittern, etc.; stork—hammerhead, bishop or African woolly-headed, jabiru, marabout—an immense B. weighing as much as 13 lb., and entirely devoid of any charm in appearance; ibis—spotted-breasted, Upper Guinea olive, Bocage's olive, glossy, and many other kinds; spoonbills and flamingo; geese and duck—one remarkable variety is the pigmy or dwarf goose, which is to be found in the swamps and is an expert diver; secretary B.—this B. is restricted to Africa, where the two races into which it is divided have

a wide but local range. It is protected in Cape Colony and Kenya, for it is becoming rare. There is probably no other large B. so graceful in movement when landing or about to fly, for it resembles a miniature aeroplane most realistically, and curiously enough has never been seen to land otherwise than right into the wind. Also in Africa are found the vulture, falcon and eagle, kite, buzzard, hawk, harrier, francolin—notably the Cameroonian mountain francolin discovered in 1909; partridge and quail—the African blue quail is the smallest member of the Phasianidae, being only $5\frac{1}{2}$ in. long but conspicuously coloured; guinea-fowl; land rail, only 5 in. long; African moorhen and Senegal and Cameroonian pinfoot; Sudan bustard or paauw—the cock scales up to 22 lb. and has an enormous wing expanse in flight—Nubian bustard, Senegal bustard or knobhaan, and others; jacana or lily-trotter—a B. of reddish-brown body of striking appearance to be found over the whole Ethiopian region; snipe, plover, sandpiper, phalarope, gull, tern, pigeon, and dove; and parrots—notably the grey variety so well known to Europeans, the Congo red-crowned, the Gabun, Nim-Niam, and the scarlet and yellow-bellied varieties. (See David Bannerman, *Birds of Tropical West Africa*.)

India is less noted for B.s of gorgeous plumage than other tropical countries, but there are many curious kinds, and the parrot tribe is known for its beauty. The varieties of parrots are far more numerous than elsewhere in the world. Eagles, gervauls, vultures, and other B.s of prey abound, but mostly are not comparable for size and plumage with those in some other countries. Hawks were long trained for hunting, two of the most suitable varieties being the lagar and shain, both hawks of the peregrine type. The mina (or myna) of the starling tribe are kept as pets by the natives; kingfishers and herons are caught for their feathers. Other B.s found in India are the pigeon, quail, plover, widgeon, teal, sheldrake, etc., and various kinds of jungle and water fowl.

The following are the prin. B.s to be found in Canada: grebe, diver, loon—yellow-bellied, Pacific, etc.; puffin, horn-billed and other guillemot, and various kinds of auk and auklet; gull, kittiwake, tern, shearwater, petrel, pelican, mallard, sheldrake, duck, elder, scoter, Canada goose, bean goose, cackling goose; whistling swan—a rare and accidental visitor; whooping swan; heron, egret, coot, crane, woodcock, snipe, sandpiper—many species, especially the least sandpiper, which breeds on Sable Is.; marked godwit, ptarmigan, hawk, golden eagle—breeds in the Ungava dist.—grey sea, bald, and other eagles; owl, woodpecker, night hawk, lark, cowbird, oriole, and snow bunting—an abundant winter and early spring resident in the E. provs.; sparrow, martin, warbler—numerous varieties—shrike, wren—California, Alaska, Kadiak, and numerous other varieties; thrush, wheatear, bluetthroat.

See T. H. Huxley, *On the Classification*

of Birds, 1867; C. Dixon, *Lost and Vanishing Birds*, 1898; F. H. Knowlton and R. Ridgway, *Birds of the World*, 1909; W. Rothschild, *Extinct Birds*, 1913; J. Arthur Thomson, *Biology of Birds*, 1923; A. L. Thomson, *Problems of Bird Migration*, 1926, and *Birds: an Introduction to Ornithology*, 1927; A. Wetmore, *Migration of Birds*, 1926; E. M. Nicholson, *How Birds Live*, 1927; C. S. Elton, *Animal Ecology*, 1927; E. F. Daglish, *Name This Bird*, 1934, and *Birds of the British Isles*, 1948; A. H. Chisholm, *Bird Wonders of Australia*, 1935; F. B. Kirman, *Bird Behaviour*, 1937; P. A. Taverner, *Birds of Canada*, 1938; H. F. Witherby, *Handbook of British Birds* (5 vols.), 1938-41; A. Roberts, *Birds of South Africa*, 1940; S. Gordon, *Wild Birds in Britain*, 1943; J. Fisher, *Watching Birds* (new ed.), 1953; *Birds as Animals*, 1939, (vol. 1 revised, 1954).

Bird-catching Spider, large hairy spider found in many hot countries. It belongs to the genus *Mygal*. When stretched out it takes up a space from 6 to 9 in. across, although the body is only about 2 in. It lives in trees, or in hollows under rocks, and there it spins its curiously shaped web or nest. It goes out at night to hunt for its food of insects and, as is stated, to ensnare young birds. It has been said that the webs are strong enough to make travelling difficult in the forests.

Bird Cherry (*Prunus padus*), family Rosaceae, native tree of the temperate regions of Asia and Europe, being frequently found in Britain. The Scottish name for it is hagberry, which means wood berry. Unlike the wild cherry, the flowers bloom after the leaves have fully appeared in early May. The fruits are small, black, and bitter in taste, and only fit for birds' food, though sometimes used for colouring brandy and wine. The wood is used by cabinet-makers.

Bird Lice, or Mallophaga, name given to a family of insects or parasites which affect birds. These parasites are shaped like lice, but they are not blood-sucking creatures, since their mouths are formed for biting. Their bodies are ringed round the thorax. They feed upon the skin of the birds and eat the feather and sometimes the blood too. It is found that they commonly affect the fowls of the farmyard, and will sometimes be discovered in animals. Where fowls are kept near cats or dogs, the latter are likely to be affected also by these pests, which feed on the hair and fur.

Bird Lime, sticky substance obtained in various ways. It is got from the bark of the holly-tree, and from mistletoe, and boiled with water. It is also prepared from flour; the starch is washed out of the flour, and the gluten left is used for B. L. The substance is frequently utilised for ensnaring birds.

Bird of Paradise, various species of birds of the family Paradisidae, which are natives of Australia and the Malay Archipelago. They are related to Corvidae, or crow family, but though the females are inconspicuous in appearance,

the plumage of the males is gorgeous and varied in colour. They are smallish birds, extremely active, and have compressed beaks, large toes, and strong feet. Their food consists chiefly of fruits, seeds, and the honey taken from flowers, but it may also include insects and small animals, such as worms. The bower-birds (q.v.) of Australia are closely related to this family, and are noted for their constructive ability. The chief species of the Paradisidae are *Paradisaea apoda* of Linnaeus, the great bird of paradise, about 18 in. in length, the males having brilliant plumes of great length springing from



BIRD OF PARADISE (MALE)

beneath their wings; *Cinnurus regius*, king bird of paradise, a native of New Guinea, which has scarlet and green plumage; *Ptiloris paradisica*, black rifleman of N. Australia; *Diphyllodes magnifica*, magnificent bird of paradise; *Pteridophora alberti*, common to New Guinea.

Bird of Paradise (constellation), see APUS.

Birdcage Walk, St James's Park, London, connecting Buckingham Gate with Storey's Gate, is named after the aviary estab. there in the reign of James I. The steps known as Cockpit Steps at the Storey's Gate end of the Walk led from Dartmouth Street to the Cockpit. The latter was abolished in 1816, though it had then long ceased to be used for sporting purposes.

Birdswald, site of the Rom. station of Camboglanna, on the bank of the R. Irthing, 14 m. N.E. of Carlisle, Cumberland. It is the largest fort in Hadrian's Wall (q.v.).

Bird's Eye, name given to *Veronica chamaedrys*, also known as *Angels' Eyes* and *Germander Speedwell*, a common perennial; the B.'s E. *primrose* is *Primula farinosa*, with yellow-throated, rosy lilac flowers. Both plants are natives of Britain and Europe.

Bird's-eye Limestone, limestone found

in the Trentin group of N. America. It is named from the white cross-sections that appear in the stone.

Bird's-eye View, term used to describe drawings made in a manner of perspective where the eye is supposed to look down from above on to the land illustrated. The difficulty naturally is to show the relative vertical heights accurately so as to give a correct impression.

Bird's Foot (*Ornithopus perpusillus*), wild plant belonging to the family Leguminosae. Its name is derived from its pod cluster resembling the foot of a bird. It grows in sandy soil, and is sometimes cultivated on the Continent as food for sheep. The bird's-foot trefoil, or lady's slipper (*Lotus corniculatus*), also a leguminous herb, is a perennial, valuable in meadow and pasture.

Bird's-foot Trefoil (*Lotus corniculatus*), plant of the family Leguminosae, which is common in Brit. meadows, and is noted for its beaked carina or keel and nearly straight legume. It affords good pasture, and received its name from the resemblance of a group of pods to a bird's foot.

Bird's Nest, either the popular or book-name of sev. plants: the wild carrot (*Daucus carota*); the common parsnip (*Pastinaca sativa*); yellow bird's nest (*Monotropa hypopitys*); the fern, *Asplenium nidus*: bird's nest orchis, *Neottia nidus-avis*—a plant with dingy brown flowers growing spikes and found in N. countries.

Bird's Tongue, common name for *Ornithoglossum glaucum*, and *O. undulatum*, S. African liliaceous plants with perianth segments shaped like a bird's tongue. *Strelitzia* species are known as B. T. Flower.

Birdwood, Sir George Christopher Molesworth (1832-1917), administrator and author, b. Belgium, in the Decenn, and educ. for the Indian medical services, which he entered in 1854 on the Bombay staff. Subsequently he became sheriff of Bombay, and did much to promote education there. B. left India in 1868 and in 1871 was appointed by the India Office in permanent control of Indian exhibits at S. Kensington, which collection he reorganised. He was one of the founders of 'Prinnsfree Day' in memory of Lord Beaconsfield. He was knighted in 1881.

Birdwood, Field Marshal William Riddell Birdwood, 1st Baron (1865-1951), soldier, educ. Clifton College and the Royal Military College, Sandhurst. He entered the Royal Scots Fusiliers in 1883; transferred to the 12th Royal Lancers, 1885; captain 11th Bengal Lancers, 1896; promoted to colonel, 1905, general, 1917, and field marshal, 1925. His earlier campaigns were the Hazara expedition, 1891, expedition, 1892, and the Tirah expedition, 1897-8. In the S. African war, 1899-1902, he was brigade-major to Mounted Brigade in Natal, later military secretary to Commander-in-Chief (Lord Kitchener). In the Mohmand expedition, 1908, he was chief of staff; awarded the D.S.O. in that year. In the First World

War he was with the Mediterranean Expeditionary Force, first as G.O.C. Australian and New Zealand Army Corps and then as Commander-in-Chief of the whole force. Commanded the Dardanelles Army during the evacuation of the Gallipoli Peninsula, 1915-16, and subsequently commanded Australian and New Zealand troops, and, later, the Fifth Army in France. By his fine handling of the Australian and New Zealand forces he gained a great military reputation. At the close of the war he received a baronetcy and a grant of £10,000. In 1920 he was appointed G.O.C. N. Army in India, and from 1925 to 1930 he was Commander-in-Chief of the Indian Army. G.C.M.G. 1919; G.C.B. 1923; G.C.S.I. 1930; G.C.V.O. 1937; raised to the peerage in 1938 as Baron B. of Anzac and Totnes. He was colonel of the 12th Lancers (1920), of the Royal Horse Guards (1933), and of other Indian, Australian, and New Zealand regiments. He was master of Peterhouse College, 1931-8. He wrote *Khaki and Gown; an autobiography*, 1941, and *In My Time; recollections and anecdotes*, 1946.

Biretta, stiff square hat with three erect wings and a central bob worn with a cassock in church by clerics. The confinement of the scarlet B. is part of the ceremonies at the creation of a cardinal. The B. of a bishop is purple, while that of an ordinary priest is black. It is derived, like the academic mortar-board, from the soft square cap common at the time of the Reformation.



BIRETTA

Birgus, generic name of some decapod crustaceans of the family Cenobiridae which are chiefly terrestrial. They are hermit-crabs, dwelling in a hole by day, and coming out at night to seek for food, which consists largely of the fruit of the coco-nut tree. *B. latro*, the robber-crab or purse-crab, is a common species which inhabits the Indo-Pacific region.

Birjand, dist. and tn of Persia in the Khorasan prov., about 210 m. N.E. from Kerman, and 240 m. S. from Mashhad. Pop. of tn 23,000.

Birkbeck, George (1776-1841), doctor, b. Settle, Yorks. After studying medicine at Edinburgh and London he practised successfully in both cities. He is best remembered as a populariser of science, the founder of Mechanics Institutes and a founder and member of the first council of Univ. College, London. At 23 he accepted the chair of natural philosophy at Glasgow, and in 1800 gave a course of lectures there to which working men were admitted on payment of a low fee. After a long and successful growth this dept of the univ. became the Glasgow Mechanics' Institution in 1823. In the same year a Mechanics' Institution was opened in London for the purpose of giving education

to students in the principles of the Arts they practise, and the various branches of Science and useful knowledge.' B., who had come to London in 1804, lent a large sum of money to build a lecture room, and until his death continued to take an active interest in an institution which was later to be known as Birkbeck Institution and finally Birkbeck College (q.v.). Subsequently Mechanics' Institutes throughout the country did a great deal to popularise science.

Birkbeck College, school of London Univ. (q.v.) primarily for part-time students wishing to read for various internal degrees. All lectures are held in the evening. Following a proposal by Thomas Hodgskin and J. C. Robertson B. C. was founded in 1823 as the London Mechanics' Institution by Dr George Birkbeck with the support of sev. radical thinkers of the day, notably Francis Place. The original object was to instruct craftsmen in the physical sciences and in economics. In 1920 during the presidency of Lord Haldane of Cloan, who greatly assisted in its advancement, B. C. became a constituent college of London Univ. Present students number over 1400. See O. Dellsie Burns, *A Short History of Birkbeck College*; E. H. Warmington, *Birkbeck College 1939-1945*; Thomas Kelly, *George Birkbeck, Pioneer of Adult Education*, 1957.

Birkdale, part of Southport, England. Pop. 22,000.

Birkebeinar, name of a political faction which existed in Norway in the 12th and 13th cents.; the name arising from the birch-bark footwear which the poverty of the members compelled them to substitute for boots. The party arose in opposition to Erling Skakke and his heir Magnus, and fought for the descendants of Sigurd Mund, i.e. for King Sverre and his heirs, being successful in 1217 in having Haakon Haakonsson elected King of Norway.

Birkenfeld, Ger. tn in the Land of Rhineland-Palatinate (q.v.), 55 m. WSW. of Mainz (q.v.). It was formerly the cap. of a principality (area 194 sq. m.) which was tributary to Oldenburg but was completely surrounded by Prussian ter.; in 1937 it was made part of Prussia. The tn has an agric. trade. Pop. 3000.

Birkenhead, Frederick Edwin Smith, 1st Earl of (1872-1930), statesman and lawyer, b. Birkenhead, and educ. at Birkenhead Grammar School and Wadham College, Oxford. He gained first-class honours, School of Jurisprudence, 1894; was Vinerian Law scholar, 1895; fellow and lecturer of Merton, 1896; lecturer of Oriel, 1897; Univ. Extension lecturer in Modern Hist., 1898; and examiner in Final Schools, 1899-1900. He was called to the Bar in 1899. In the 'Tariff Reform' election of 1906 he was elected as Conservative member for the Walton div. of Liverpool, and his maiden speech in the House that year, which was an unrestrained attack on the Gov. and 'Free Trade,' had the effect of lifting the depression from which the Conservative party was suffering after its crushing

defeat at the polls and establishing B. as a brilliant speaker. In 1911, while still under 40, he had become a privy councillor and a leader of his party, and when the first Coalition Ministry was formed in May 1915 he became solicitor-general, and in the following Nov. attorney-general with a seat in the Cabinet. The latter office he again held in the second Coalition of Dec. 1916, and was created a baronet in Jan. 1918. In Jan. 1919, at the age of 46, he became lord chancellor. On the Wool-sack his originality and strong personality were felt throughout the Lords, and he showed a generosity and breadth of view which compelled those who had thought of him merely as a combatant lawyer to change their views. He was made a viscount in 1921, and Earl of B. in 1922. In Baldwin's second gov., Lord B. became secretary of state for India but his conduct in this office caused much criticism. He resigned in Oct. 1923, not, apparently, owing to any disagreement with his Cabinet colleagues, but in order to enter business life. His greatest achievement as a lawyer was the Law of Property Act, 1922, which greatly simplified the conveyance of land. His pub. include *Points of View*, 1922, *Contemporary Personalities*, 1924, *Famous Trials of History*, 1926, *Fourteen English Judges*, 1926, *Law, Life, and Letters*, 1927, and *More Famous Trials*, 1928. See life by his son, 1933 and 1935.

Birkenhead, co. bor. and seaport of Cheshire, England, situated at the mouth of the R. Mersey, on the E. coast of the Wirral, 13 m. NNW. of Chester and 194 m. from London by rail. It has an area of 8598 ac. It is a tn of purely modern growth, owing its increase in size to the construction of its docks, having a meagre hist. previous to the year 1820 when it was a small hamlet. The railway station is the most northerly of the former G.W.R. connecting the W. of England with the N. and is the terminus for the sea journey to the Isle of Man. A Benedictine priory of which the ruins may still be seen, was founded at B. in the 12th cent. by a Norman baron, and to this priory was granted the monopoly of ferries by Edward II. Previous to about the year 1820, B. had a pop. of less than 50 and in 1822 this pop. had not risen to more than 300. In 1844 parl. powers were obtained for the erection of a tidal basin and dock which were first planned by William Laird, and opened in 1847. Eleven years later, the dock was handed over to the Mersey Docks and Harbour Board, a corporation created especially to control the harbourage of the Mersey. The tn itself had also during this time grown and improved. In 1836, it received the grant of a market, and in 1861 was made a parl. bor. It was granted a charter of incorporation in 1877, and in 1898, the townships of Cloughton, Oxton, Rock Ferry, and Tranmere were incorporated in the bor. and in 1928 the bor. boundaries were again extended by the inclusion of Landican, Thingwall, Prenton, and part of Bidston; in 1933 a further extension was made by the inclusion of

Nootorum, Woodchurch, and parts of Arrowe, Bidston, and Upton. In 1909, a new covered market was opened and also a large central and two small branch libraries, the gift of Sir Andrew Carnegie. In Dec. 1928, a new art gallery and museum were added to the municipal buildings. B. contains many fine buildings including a market hall, a tn hall, an art school (given to the tn by Sir John Laird), and a new central library opened in 1934. A new technical college is under construction. The main architectural feature of B. is Hamilton Square, one of the largest in England. The communications of the tn with Liverpool are good. An electric railway connects the two towns through the Mersey railway tunnel (opened in 1886), and road transport is carried through the Queensway tunnel (opened in 1934). The tn is also connected with Liverpool by the corporation's fleet of ferry boats, the monopoly of which was bought from the Lord of the Manor in 1842. On the dockside are the flour mills which make B. the centre of the milling industry in Europe, and second only in the world to Minneapolis. The dock estate covers an area of 806 ac. and the docks have a lineal quayside of 9½ m. Huge storage warehouses and abattoirs are erected along the quays and the ship-building yards of Cammell Laird & Co., are situated at B. This firm has launched over a thousand ships from the B. yards. The tn has its own water undertaking, and motor bus services. It is a quarter sessions and parl. bor., returning 1 member to the House of Commons. During the war of 1939-45, the tn suffered severely from enemy air attack, and much damage was done to residential districts, but fortunately the prin. buildings were not affected. B. forms part of the Merseyside Development Area, and since the end of the war has attracted many new types of industry thus enlarging its sphere of industrial activity beyond the main industry of shipbuilding and repairing. Pop. 142,400.

'Birkenhead,' Brit. troopship, wrecked off Point Danger, Simon's Bay, 26 Feb. 1852. The soldiers were mustered on deck and remained steadily in their ranks while the boats took off the women and children; 436 men were drowned. King William I of Prussia ordered the story to be read out to each of his regiments on parade, as an example of disciplined heroism.

Birket-el-Keroun, or el-Qurun (lake of horns), lake of Middle Egypt, 50 m. SW. of Cairo. It has an area of nearly 80 sq. m., and is situated 141 ft below sea level, having a depth at its deepest parts of about 60 ft. The classical name is Moeris (q.v.).

Birkett, Sir Norman (1883-), lawyer and politician, b. Ulverston, Lancs, educ. at Emmanuel College, Cambridge. He was called to the Bar, Inner Temple, in 1913, and took silk in 1924. In 1923 he entered Parliament as Liberal M.P. for the E. div. of Nottingham. He lost his seat in 1924, but was again M.P. from 1929 to 1931. During the Second World War

he was chairman of the Advisory Committee for Defence Regulation 188, and became a judge of the King's Bench Div. in 1941, in which year he was knighted. In 1945 he was appointed a deputy member of the International War Criminal Court. He became a Privy Councillor in 1947, and was President of the National Book League from 1949 to Dec. 1954. He was created a baron in 1958.

Birkhäuser, Swiss publishing house in Basel, with a branch in Stuttgart. The firm was estab. in 1879 as a printing office, and a year later started publishing. B. specialises in large popular eds. of classics—Goethe, Schiller, Heine, Shakespeare (Ger. trans.), Jeremias Gotthelf, Gottfried Keller, C. F. Meyer, Homer, Ulrich Bräker, and Pestalozzi; mathematical, scientific, and Swiss historical works; and books on Swiss monuments. B. also issues sev. scientific reviews.

Birlad, cap. of the prov. of Birlad, Rumania, on the railway from Jassy to Galati. Pop. (1930) 26,200. Noted for its ann. horse fair; manufs. soap and candles.

Birmingham, George, see HANNAY, J. O. Birmingham, city and municipal co. and parl. bor. of England, situated in the NW. of Warwickshire with suburbs extending into Staffs and Worcs; 113 m. from London by rail and 85 m. from Manchester. The municipal area is about 80 sq. m. (51,147 ac.), with a pop. of 1,118,500. In 1911 the boundaries were extended to include the bor. of Aston Manor and other dists. In 1928 part of the urb. dist. of Perry Barr was incorporated. The tn was enfranchised in 1832, and now returns 13 members to Parliament. It became a bor. in 1838, and a city in 1889. The corporation consists of the lord mayor (created in 1896), 38 aldermen, and 114 councillors.

With Wolverhampton, Walsall, Wednesbury, and other tns of the 'Black Country' dist., B. forms one of the most important of industrial areas. It is the second city of Great Britain, and the chief hardware centre of the world, being the largest manufacturing city in England. It is famous for its metal industries, which have been important since the latter half of the 17th cent. The most outstanding is the motor-car industry. Next in importance come industries concerned with brass-working, jewellery, gold, silver, gilt, and iron. Extensive manufs. are those of pins, buttons, and other dress accessories, nails, screws, steel pens, tools, cycles, and machinery. Other industries are railway-carriage building, electro-plating, plastics, and chemicals. In all it is estimated that there are some 1500 distinct trades, and the city consequently possesses a large pop. of skilled artisans.

The city has many fine streets and notable buildings. Mention must be made of the thoroughfares of New Street, Corporation Street, Broad Street, and Colmore Row, and amongst the chief buildings, of the council house and art gallery (1874-81), containing a fine collection of Pre-Raphaelite paintings, Eng.

water-colours, sculpture, ceramics, costume, and sections on natural hist. and archaeology. There is a branch museum at Aston Hall, a Jacobean mansion furnished as a private house of that period, and a museum of Science and Industry in Newhall Street, which possesses early inventors' models and a fine collection of arms. Other notable buildings include the tn hall, completed in 1834, with a hall capable of seating 2000 people; the central free library; the Victoria law courts; the Civic Centre; and the Hall of Memory, opened in 1925, a memorial to the men and women of B.

educational estab. is the King Edward VI Grammar School, founded in 1552. Other educational institutions are the Midland Institute, the Municipal College of Technology, the Municipal College of Art, Selly Oak Colleges, and Queen's College. The prin. libraries are the Birmingham Library (private), founded in 1779 and greatly enlarged in 1798 by Dr Priestley; the Central Reference Library, including the Shakespeare Memorial Library, one of the finest collections of its kind in the world, and the Birmingham Collection; the Commercial and Patents Library, the Technical



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THE CIVIC CENTRE (LEFT) AND HALL OF MEMORY, BIRMINGHAM

who fell in the two world wars. B. is the seat of a bishopric, and the present cathedral was formerly St Philip's Church, built in the early 18th cent. by Thomas Archer. Until 1715 there was only 1 par. church, St Martin's, dedicated in the 13th cent. but wholly rebuilt in 1873-5. Other churches are St Mary's (1774) and St Paul's (1779). A large number of the churchgoers of B. are non-conformist. The Unitarians are an old-estab. body in B., as also are the Wesleyan Methodists, who were estab. by John Wesley himself, in 1745; and the Baptists, whose original chapel in Cannon Street was built in 1738. The chapel known as the New Meeting, in Moor Street, was notable as having been the scene of Joseph Priestley's ministerial labours from 1780. There is also the Rom. Catholic Cathedral of St Chad, and the Methodist Central Hall. The city possesses a univ. (see B. UNIV.). The oldest

Lending Library, and the Central Lending Library with branches throughout the city.

There are about 4200 ac. of parks and open spaces, chief of which are Lickey Hills (523 ac.), Cannon Hill (80 ac.), Highbury (73 ac.), Handsworth (63 ac.), and Aston (50 ac.). The Welsh water-supply scheme, with its chain of reservoirs in the Elan Valley in Radnorshire, supplies B. with water, and the works, which were formally opened by King Edward VII in 1904, cost approximately £6,000,000. A new reservoir in the Claerwen valley was inaugurated by H.M. the Queen (1952). B., having a central position in the U.K., is an important railway centre, being served by 2 regions of the Brit. railways. A municipal airport opened in 1939 is now controlled by the Ministry of Civil Aviation. Within the city the transport system includes the largest municipal fleet of omnibuses in the country.

Much of B.'s municipal enterprise is due to the efforts of Joseph Chamberlain, who, as mayor of the city in 1873-5, was responsible for many undertakings. B. claims to be the 'best-governed city in the world.' Though essentially a modern tn, B. has a hist. that can be traced back to a period before the Conquest, the place having been a settlement of the Anglo-Saxons. It is mentioned in Domesday Book, and there valued at 20s. After the Conquest it passed into the possession of the Bermingham family. The owner, Wm de Bermingham, was killed on the side of Simon de Montfort at the battle of Evesham in 1265. By the end of the 13th cent. a fair-sized mkt in had grown up at the focal point of roads at the Bull Ring. In the 16th cent it was visited by Camden and the antiquary, John Leland. The latter states that there were many 'smiths in the town that use to make knives and all manner of cuttyngs tools.' It remained in the hands of the family until 1527, when the Duke of Northumberland managed to transfer it himself by preferring a false charge against Edward de Bermingham. After the attainder of Northumberland the property passed through various hands. In the Civil war B. evinced strong parliamentarian sympathies, for which it paid by being sacked by Prince Rupert in 1643. Subsequent outstanding events were the devastating plague of 1665, the 'church-and-king' riots of 1791, in which the famous Dr Priestley was an important figure, and the Chartist riots of 1839. Among a number of public monuments are those of Joseph Priestley, Thomas Attwood (banker and politician), James Watt, and Nelson. In its political hist. B. did much to win for the nation the enfranchisement of the middle classes during the days of the Reform Bill agitation. Amongst the distinguished men closely connected with B., in addition to those already mentioned, have been James Watt, who, with Boulton, perfected the steam engine here; Wm Murdock, the inventor of gas lighting; Wm Hutton, the historian; John Baskerville, the printer; Joseph Parkes, and John Bright.

In both the world wars of 1914-18 and 1939-45 B. became a centre of munition manuf., and received influxes of pop. for that reason. During the air assault on Great Britain in the Second World War, B. was a foremost objective of the enemy. An air raid in Aug. 1940 was the first of nearly 100 attacks, many during the winter of 1940-1. There were serious fire raids during Oct. The heaviest raid took place on the night of 9-10 April 1941, having been preceded by a number of raids, particularly that of 11-12 Dec. 1940, lasting over 13 hrs. Since the war, house building has been the chief concern of the Corporation, and during the period 1 April 1945 to 3 June 1954, 25,197 houses of various types have been provided. A start has already been made on the formidable task of rebuilding 5 central areas where some 30,000 old houses have to be replaced and bomb-damaged areas

replanned. In 1946 B. secured an Act of Parliament to permit the building of an inner ring road to facilitate redevelopment, and to alleviate traffic congestion. Preliminary work is proceeding on these and other schemes which will eventually change the face of B. beyond recognition.

Among dists. now within the city boundary are Bournville (q.v.), Castle Bromwich (q.v.), Edgbaston (q.v.), Handsworth (q.v.), Kings Norton (q.v.), Northfield (q.v.), and Yardley (q.v.).

Birmingham: 1. City in the co. of Jefferson, Alabama, U.S.A., 86 m. NNW. of Montgomery. It is the most important seat of the iron industry of the S. states, having numerous factories, mills, and foundries. This has accounted for its rapid growth from a tn of 3000 inhab. in 1880 to a city of 326,000 inhab.

2. City in Oakland co., SE. Michigan, U.S.A., between Detroit and Pontiac, on R. Rouge. It manufs. trailer parts, machinery, and electrical equipment, and there is truck and dairy farming. Pop. 15,500.

'Birmingham Post,' newspaper estab. in 1857 by John Feeney and Sir John Jaffray. At its foundation the politics of the paper were Radical, and after the Home Rule split of 1886 it supported the Liberal Unionist party. Later it was associated with Joseph Chamberlain's propaganda. It is now an independent paper, though generally Conservative in its views. The *H. P.*, together with the *Birmingham Mail* and the *Birmingham Weekly Post*, were bought by Lord Hiffe, formerly part proprietor of the *Daily Telegraph*.

Birmingham University, immediate successor of the Mason Science College, founded by Sir Josiah Mason in 1836, the title being altered to Mason College in 1892. In 1897 the college was incorporated under the title of 'The Mason Univ. College.' In 1898, Joseph Chamberlain suggested the idea of founding a univ. in Birmingham. A public appeal reached a total of £500,000. The royal charter was granted in 1900. In 1909, new buildings were opened at Edgbaston, about 3 m. from the city centre. At present the faculties of science, commerce, and social science are housed on this site together with the Brit. School of Malting and Brewing. The faculties of arts and law are still accommodated in the old Mason College building but it is intended to transfer these to the Edgbaston site. It is also proposed to house the depts of education and extramural studies, together with the Arts Library, at Edgbaston, when the whole univ. will be accommodated there. The faculty of medicine is housed in the Medical School, a fine building (opened 1938) on the Hospital Centre site, near the Univ. buildings, Edgbaston.

Birmam, hill in Perthshire, Scotland, about 12 m. NW. of Perth and near the tn of Dunkeld. It was anciently included in a royal forest, and has been immortalised by the reference to it in Shakespeare's *Macbeth*. There is one

remaining oak of Birnam Wood. Near Dunkeld also there is a small vill. called B. **Birobidjan**, see **BIROBIDZHAN**.

Birobidzhan, tn in the Soviet Far East, on the Trans-Siberian (q.v.), 78 m. W. of Khabarovsk, cap. of the Jewish Autonomous Oblast (q.v.). It has some industry. Pop. (1956) 37,000. Formerly a small railway station, Tikhon'kaya, it became a tn in 1928.

Birobijan, see **BIROBIDZHAN**.

Biron, title of the family of Gontaut, to which a number of distinguished marshals of France belonged.

Armand de Gontaut, Baron de Biron (1524-92), Fr. marshal. He distinguished himself in the Catholic cause at Dreux, St Denis, and Montcontour, and commanded the royal forces at the siege of La Rochelle, as a reward for which he was made a marshal of France. After 1589 he supported the interests of Henry of Navarre, and was killed at the siege of Epemay in 1592.

Charles de Gontaut, Duc de Biron (1562-1602), son of the above, distinguished himself by his bravery. He was made admiral of France, and in 1594 a marshal of France. He fought for Henry IV, and was employed by him on diplomatic missions, but in 1602, accused of treasonable correspondence with the Spaniards, he was executed in the Bastille.

Armand Louis de Gontaut, Duc de Biron (1747-93), descendant of the above. He fought during the war of Amer. Independence under Lafayette, and on his return was made a marshal. On the outbreak of the revolution he joined the revolutionaries, and was appointed to a high command. He fought in La Vendée, and was commander of the army of Flanders. He was later accused of treason and executed.

Biron, Ernst Johann de, Duke of Kurland (1690-1772), favourite of the Russian Empress Anna Ivanovna (q.v.), and during her reign (1730-40) the virtual ruler of Russia: ignorant, arbitrary, and cruel.

Birr, mkt tn of co. Offaly, Rep. of Ireland. It has a boot and shoe factory, and a textile factory. Pop. 3300.

Birrell, Augustine (1856-1933), politician and man of letters, b. near Liverpool, and educ. at Amersham Hall School and Trinity Hall, Cambridge. He subsequently studied law, became a barrister in 1875, and a bencher of the Inner Temple in 1903. He was Quain prof. of law at Univ. College, London, 1896-9. He entered Parliament as Liberal member for W. Fife in 1889, and made a name as a graceful and witty orator, his efforts in this direction giving rise to the expression 'birrelling.' He was defeated in NE. Manchester at the 1900 election, but re-entered Parliament in 1906 as member for N. Bristol, and Minister of Education in the Liberal Cabinet. The failure of his Education Bill to pass the House of Lords led to his resignation in 1907, when he was appointed chief secretary for Ireland. Relying on the assurances of John Redmond as to the state of Ireland, he was taken unawares by the Dublin

revolt of Easter 1916. He resigned his office in May; and in 1918 he retired from public life. The first series of his *Obiter Dicta*, 1884, revealed him as an accomplished essayist with a delightful style, and was followed by a *Life of Charlotte Brontë*, 1887, the second series of *Obiter Dicta*, 1887, *Res Judicatae*, 1892, *Men, Women, and Books*, 1894, *William Haslitt*, 1902, *In the Name of the Bodleian*, 1905, and other books on subjects connected with belles-lettres and law.

Birs, small riv. of Switzerland, in the canton of Basel. Near it was fought the battle of St Jacob against the French in 1444, when 1600 Swiss were annihilated in opposing 30,000 French, the French losing 10,000 men. It was also the scene of a victory of the Swiss over the Austrians in the year 1499, after which the Emperor Maximilian I recognised the independence of Switzerland.

Birs Nimrud, see **BORSIPPA**.

Birstall, see **BATLEY**.

Birth, see **CHILD**. For statistics of births see **REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES**.

Birth, Concealment of. In Eng. law it is a misdemeanour, punishable by a maximum of 2 years' imprisonment, for any person, including the mother, to conceal or attempt to conceal the birth of a child by any secret disposition of its body, whether the child d. before, after, or at the time of its birth. Avail is taken of this offence as an alternative charge in cases of persons charged with murder or manslaughter of infants, owing to the frequent difficulty of proving that the child has been, in the legal sense, a living human being. In Scots law, a woman is liable to a maximum penalty of 2 years' imprisonment if she conceals her pregnancy during the whole period, does not call for, nor has, assistance at the birth, and subsequently the child is found dead or is missing. Till 1803 such concealment was considered presumptive of murder and punished with death.

Birth, Registration of, see **REGISTRATION OF BIRTHS, MARRIAGES, AND DEATHS**.

Birth Control, term applied to the practice of preventing conception by chemical, mechanical, or other means. In its wider application, the term may be employed to mean any method of restricting or regulating the pop., such as infanticide, abortion, enforced celibacy, or what Malthus named 'moral restraint.' Infanticide and abortion were practised among primitive peoples. B. C. in the sense of the mechanical contrivance of contraception was known to the people of early civilisations, notably the Greeks and Romans, the Hebrews, the Arabians, and among Ger. and African tribes. Although such knowledge was available in Europe from the Middle Ages, no effort was made to draw public attention to it until the 19th cent. The first book on B. C. in Eng. is said to be *Every Woman's Book: or, What is Love?* by Richard Carille, pub. in 1825. Similar pubs. followed from time to time in both the U.K. and the U.S.A., until wider publicity

was given to the subject by the trial of Charles Bradlaugh and Mrs Besant in 1877 for the offence of selling a pamphlet inculcating what were then known as 'Neo-Malthusian' practices. The foundation of the Malthusian League followed the same year, Bradlaugh being president and Mrs Besant secretary. The movement rapidly became world wide. A parallel legal stimulus was given to the movement in the U.S.A. by the trial of Mrs Margaret Sanger, in 1914, as the author of the pamphlet *Family Limitation*. From these events the National B. C. League was formed, and 10 years later the first B. C. clinic was opened in New York. In Great Britain during the corresponding period the person most associated in the public mind with the dissemination of B. C. information was an Eng. woman scientist, Dr Marie Stopes (q.v.). A B. C. clinic was opened in London in 1921 largely as a result of her efforts, and clinics were subsequently opened in most cities and towns in the U.K. Both Mrs Sanger and Dr Stopes gained world-wide reputations as serious propagandists in the campaign for making B. C. information generally accessible, and the movement was further stimulated by the effects of the war of 1914-18, which brought this, among other social subjects, into the open as a matter of general interest and discussion. The movement has encountered some official opposition, amounting in some countries, as in Italy in 1925 and in Japan, to legal prohibition. In the U.K. and the U.S.A. no legal impediment was placed in the way of the movement, except by very strict interpretation of the laws relating to obscenity, and from time to time these have been invoked. The movement aroused irreconcilable opinions. The subject touches biology, medicine, psychology, economics, ethics, and religion; and as vital statistics concern the community as well as the individual, B. C. is becoming a question with which politicians may have to deal. The Rom. Catholic Church is foremost in denouncing as sinful the practice of all artificial contraceptive methods. A medical committee of the National Birth-rate Commission (not an official body), set up in 1924, was of opinion, *inter alia*, that no entirely successful contraceptive method has yet been found, and that no impediment should be put in the way of married persons obtaining knowledge of contraceptive methods. See Dr Stopes's treatise, in favour, *Contraception: its Theory, History, and Practice*, 1933 and 1937; Dr Halliday Sutherland's *Birth Control*, 1922, for a Catholic doctor's views against; A. M. Carr-Saunders's *The Population Problem*, 1936, for the wider social and economic aspects; J. G. H. Holt's *Marriage and Periodic Abstinence*, 1937; and the Amer. B. C. League's *One Hundred Years of Birth Control*.

Birth Palsy, Infantile Diplegia, or **Little's Disease**, paralytic affection caused by injury at birth, through protracted labour, the use of instruments, or other causes. The condition is often not

observed during the early years of childhood, but manifests itself when the child might ordinarily be expected to support itself on its own limbs. It is characterised by spastic paralysis, frequently limited to the lower limbs, and often associated with mental deficiency and convulsions. Considerable attention is now being given to the education of these children and to devising means for helping them to become as useful people as their infirmity will allow. There are about 20,000 spastic children in Britain. At least one special school for 'spastics' has been started. The National Spastics Society was formed in 1952 as a voluntary association to foster research into B. P. and to provide facilities for the special education and habilitation of those suffering from it.

Birtley, mining and industrial dist. of Durham, England, 5 m. from Gateshead, with cable and engineering works. Pop. 11,500.

Bisaccia (anc. *Ranula*), It. tn, in Campania (q.v.), 31 m. ENE. of Avellino (q.v.). It has a fine cathedral. Pop. 8,000.

Bisacquinio, tn in Sicily (q.v.), 27 m. S. of Palermo (q.v.). It has a trade in agric. produce and olive oil. Pop. 8,000.

Biscay, Bay of (Sp. *Golfo de Vizcaya*, Fr. *Golfe de Gascogne*, Rom. *Sinus Aquitanicus* or *Sinus Cantabrigius*), large bay of the Atlantic Ocean lying between the N. coast of Spain and the W. coast of France. Its most northerly point is the is. of Quessant, and its most westerly point is Cape Ortegal. The coastline is, in general, regular, but there are some inlets on the Fr. coast, the chief being the Gironde and the estuary of the Loire. The Sp. shore, which is about 400 m. long, is bold and rocky, whereas the Fr. coast, which is also about 400 m. long, is, in most places, low and sandy. The bay is noted for the diversity of its currents: westerly gales are prevalent in it, and it is a by-word among travellers for its rough seas.

Biscay, Province of, see *VIZCAYA*.

Bisceglie, It. seaport, in Apulia (q.v.), on the Adriatic, 20 m. NW. of Bari (q.v.). It has a cathedral (partly 11th cent.), and a ruined Norman castle. There is a trade in agric. produce, olives, and wine. Pop. 39,100.

Bischof, Karl Gustav (1792-1870), Ger. chemist and geologist, b. Würl, near Nuremberg. His most important work was a *Manual of Chemical and Physical Geology*.

Bischoff, Mount, in Tasmania, situated 160 m. from Launceston via Burnie. It is a mining dist., being specially noted for the rich yield of tin ore, which was discovered in 1872. In the short space of 2 years (1884-6) there was an output of more than 2000 tons.

Bischofgrün, Ger. vil. in Upper Franconia, Bavaria, at the N. foot of the Ochsenkopf. It is a winter resort.

Bischofswerda, Ger. tn in Upper Lusatia, Saxony, 20 m. E. of Dresden. B. has textile factories and machinery is manuf. Granite is quarried in the vicinity. Pop. 10,850.

Bischwiller, Fr. tn in the dept of Bas-Rhin, on the Moder. It was formerly an episcopal tn, and had a famous fair. It manufs. textiles and cartridges. Pop. 7800.

Biscop, Benedict, see BENEDICT BISCOOP.
Biscuit (Fr. 'twice-cooked'), kind of hard, dry bread which has not risen, so made in order to be preserved without deterioration for a long time. Common sea B.s, or ship bread, are totally unfermented, whilst captain's B.s are partly fermented. All the other forms of B. are fermented. Various machines have been invented for B.-making, and in a modern factory the B.s are never touched by hand. The various ingredients for hard B.s are kneaded into a stiff dough by a machine, 'braked' or rolled out between rollers, then cut up into squares by a machine which has a pair of rollers to compress it to the required thickness. The dough is then carried along on a web which takes it under a block, whose cutters cut it into the shape required. The cut B.s then travel slowly through an oven for about a quarter of an hr, on a wire frame; they are then finished and are packed in tins. There are innumerable varieties of B.s, and B.-making is a rapidly increasing industry.

Biscuit, term applied to unglazed earthenware and porcelain, whether deliberately left without a glaze, as, for example, the soft paste figures of Vincennes, Sèvres, and Derby, or when in the unfinished state between the first firing and the application of decoration previous to the second firing and glazing. See EARTHENWARE; DERBY; PORCELAIN; SÈVRES.

Bish, see BIKIL.



A YOUNG BISHAR

E.N.A.

Bisharin, name of a people of E. Africa, to whose stock belong tribes dwelling between the Blue Nile and the Ethiopian

highlands. They belong to the Moham-medan religion. See also BEJA.

Bishop, Sir Henry Rowley (1786-1855), musical composer, b. London. He was trained by Francesco Bianchi, who was at this time settled in London. B.'s first composition performed publicly was the music to a one-act piece called *Angelina*. In 1809 he produced his first opera, the *Circassian Bride*, the scenery of which perished the day after the first performance in the great fire at Drury Lane. In 1810 he was appointed composer to the Covent Garden Theatre. In 1825 he transferred himself from Covent Garden to Drury Lane. He was already one of the directors of the Philharmonic Society, which had been founded in 1813. *Maid Marian* and *Clari*, or the *Maid of Milan* were produced in 1822 and 1833; in the latter occurs the famous air 'Home Sweet Home' in various forms as a kind of theme-song. In 1830 he was appointed musical director at Vauxhall. In 1842 he was knighted, being the first musician who ever received that honour, and in 1848 he succeeded to the chair of music at Oxford. His very numerous works for the stage, including operatic pieces, 11 adaptations from Scott's novels, incidental music (including 11 Shakespeare plays), ballets and adaptations of foreign operas amounting to perversions, are all forgotten; his glees survived longer, but perished with the fashion for that class of vocal music; all that remains are three songs that are still charming period pieces: 'Home, Sweet Home,' 'Should he upbraid,' and 'Lo, here the gentle lark.' He d. in impoverished circumstances, though up to his time few composers ever made more by their work.

Bishop, Isabella (1832-1904), Eng. traveller and author, daughter of the Rev. Edward Bird. *The Englishwoman in America*, her first book, consists of letters written during a visit to Canada at the age of 22. Among many journeys the most important was one she undertook into the interior of China. She wrote many books descriptive of her travels. The following were pub. between 1880 and 1889: *Unbeaten Tracks in Japan*, *Journeys in Persia and Kurdistan*, *Among the Tibetans, Korea and her Neighbours*, *The Yangtze Valley and Beyond*, *Chinese Pictures*. She was married in 1881 to Dr John B., an Edinburgh physician. In 1901 she rode 1000 m. in Morocco and the Atlas Mts. She was the first woman to become a fellow of the Royal Geographical Society.

Bishop, William (1554-1624), Eng. priest, studied theology at Rheims and Rome. In 1583, having been ordained priest, he was sent to the Eng. mission, and imprisoned in Marshalsea, 1583-4. Later he was again imprisoned, this time at the Eng. college in Rome, as leader of 'a factious party.' In 1611 he was imprisoned for refusing the oath of allegiance to James I. In 1623 he was appointed vicar apostolic with ordinary jurisdiction over the Catholics of Great Britain, and Bishop of Chalcodon, but d. shortly afterwards.

Bishop, William Avery (1894-1956), Canadian air-ace. In the First World War he joined the Canadian cavalry, and later was seconded to the Royal Flying Corps. On the W. front he brought down no fewer than 72 Ger. machines, and then in 1917 he was sent on training work to Canada, returning to France in 1918. He was awarded the M.C., D.S.O., with bar, V.C. (on 13 Aug. 1917), and the D.F.C. At the end of the war he was a member of the Canadian General Staff with the rank of lieutenant-colonel, and his military career continued in the Canadian Air Force: Group-Captain, 1931; Air Vice-Marshal, 1936; Air Marshal, 1938. In 1940 he was appointed director of recruiting for the Canadian Air Force. C.B., 1944.

Bishop (Gk *episkopos*; A.-S. *bisceop*), overseer or overlooker. A term that in the early apostolic Church was closely allied with the word elder. The word is used in the N.T. on sev. occasions, as synonymous with the word elder. There is no such clear difference made between these two ranks in the Church, as, for example, between B.s and deacons. The duties of B.s, as traced in the N.T., are general superintendence of the churches, pastoral duties which are specially emphasised, and teaching. Within the Catholic Church the B. was recognised as the highest dignitary of the hierarchy of the Church, with special spiritual functions and with certain rights of oversight over the lower orders of the clergy. By the end of the 2nd cent. AD the claims of the B.s were estab. much on the lines of the present day, and the theory of the apostolic succession was put forward. By the same time the limitation of the authority of the B. to the diocese had also been put forward and was generally accepted. In the early Church this was probably necessary, since the frequent attacks upon the Christian religion made it necessary that some definite order and ruling should be given to it. The power and the duties of the B. remained much the same during the Middle Ages, from the time of their conception during the 3rd cent. The Council of Trent laid down that the B. must be a man of approved learning, of at least 30 years of age, and legitimate. The method of election of B.s has altered considerably since the period of the early Christian Church. B.s were originally chosen by the people, the remaining B.s of the prov. having the right of veto. Gradually this power departed from the people and fell into the hands of the prov. B.s, who were subject to a veto from the metropolitan. Next the power passed into the hands of the cathedral chapter, still subject to the veto of the metropolitan and later of the papacy. Gradually the sole power of confirmation passed into the hands of the Pope in the W. Church, and with this right of confirmation there came also the demand for the sole right of nomination. This claim was made by the papacy from the early days of the 13th cent., and in Eng. hist. we find Pope Innocent III refusing to ratify the appointment either

of the nominee of the cathedral chapter or of the king himself, but taking the full right of nomination into his own hands and placing Stephen Langton in the archiepiscopal throne of the prov. of Canterbury. At the present time in the Rom. Catholic Church the Pope has the right to nominate the B.s in a number of countries. But in some, by concordat, the political authorities have some say in the nominations, e.g. in Spain, Austria, and France. The Pope, however, claims the right of excluding unworthy nominees, he being the sole judge of eccles. worthiness. The Council of Trent prescribed a formal examination before the cardinals in Rome, but this is now obsolete, academic degrees or equivalent testimonials being accepted as evidence of theological knowledge, evidence of neighbouring ecclesiastics, etc., being received as regards other qualities. In other countries the Pope nominates the B. after considering a list submitted by the cathedral chapter, as in England, or the B.s of the prov., as in Ireland, or the apostolic delegate, as in the U.S.A. His choice, however, is not confined to the names on such a list. Very few cathedral chapters have the right of *electing*, in the strict sense. After election the new B. must be consecrated within 3 months. On taking possession of his see, he becomes the immediate and ordinary pastor of his diocese, subject to the Pope, or in missionary countries, to the Congregation of Propaganda. Even if assisted by a coadjutor B., he is bound to residence, nor may he be absent for more than three months in the year without very grave cause. A metropolitan, usually an archbishop, has little power in the dioceses of the other B.s of his prov. (his suffragans), except by special delegation by the Holy See. Oriental B.s are subject to their own patriarchs and through them to the Pope. But as far as the 'power of order' goes, a B. is inferior to none. He has full and sole authority to confer holy orders, to consecrate, to confirm, to give benediction, and to anoint kings. There are also titular B.s, that is, B.s who have received the episcopal consecration but have no diocese, and hence are used chiefly to assist other B.s of the Church and to represent the Pope. The Rom. Catholic B. ranks next to a cardinal, is styled in England the Right Reverend, and receives in conversation the title of My Lord B. The *Catholic Directory* gives the number of archiepiscopal sees throughout the world as 347, the number of episcopal sees as 1212, and the number of titular sees as 237. There are 9 archiepiscopal sees in Great Britain and Ireland, divided into 14 dioceses in England and Wales, 4 in Scotland, and 25 in Ireland. The insignia of the B. are the ring, the pectoral cross, the pastoral staff, the vestments, the mitre, and the throne. In the Reformed or Lutheran Church of the Continent the title of B. remained after the Reformation. In many cases the spiritual duties of the B. ceased, and the title was used purely as a secular and political one. In these cases,

however, where the title was used in the spiritual sense, the holder of the title did not claim unbroken apostolic succession. The general term used at the present time is that of Superintendent. The title of B. also still survives in other Protestant churches, e.g. in the Moravian.

Anglican Bishops. When due allowance is made for the doctrinal changes of the Reformation, the position and functions of the Anglican B.s are similar to those of the Rom. B.s. Only they have the right of confirmation and the ordination of priests. The method of election, however, differs since the nomination of B.s, though nominally in the hands of the Cathedral chapter, has been firmly vested in the Crown since 1534, by a statute of Henry VIII. which was re-enacted during the reign of Queen Elizabeth I. Where the Anglican Church is not estab., as in Scotland, Ireland, and Wales, and elsewhere in the Brit. Empire, the state has no say in the appointments. In England, however, the Crown is notified of the vacancy, and a *compte d'élire* is given, accompanied by a letter which nominates the choice of the Crown. The chapter is bound by law to elect this nominee, and failing such election the B. can be declared elected by royal letters patent under the Great Seal. The archbishop of the prov. is then notified and proceeds to the consecration of the B. elect. This consecration is usually carried out by the archbishop in person assisted by some or all of the prov. B.s. But a bishopric in England is also a barony, and the B. has to pay homage and take the oath of allegiance to the queen in person according to the old rites of the feudal baronage. In the prov. of Canterbury there are 30 dioceses and in the prov. of York 14. The Church of Wales is divided into 6 dioceses, the Church of Ireland into 12, and the Episcopal Church of Scotland into 7. In England a certain number of seats are allotted to the B.s in the House of Lords. At an earlier period all B.s sat in the House of Lords, but since the growth of the Church has led to the appointment of a great number of B.s, it has since been decided that the 2 archbishops, together with the B.s of London, Winchester, and Durham, should always sit in the House of Lords, the remaining 25 seats being filled by the B.s in the order of the seniority of their consecration. In addition to the powers which B.s have of ordination, consecration, and confirmation they have also jurisdiction over the clergy of their diocese, a jurisdiction which is regulated by the Clergy Discipline Act and the Public Worship Regulation Act. The B.s of the Church of England are ranked just above the barons of the kingdom, and are addressed by the title of Right Reverend. They have also the legal style of My Lord; but their wives have no title or precedence. The insignia of the Anglican B. are the rochet and chimere, the episcopal throne, the mitre, the pastoral staff, and the pectoral cross.

Suffragan Bishops. For Suffragan B.s in the Rom. Catholic Church, see above. In the Anglican Church Suffragan B.s are

those appointed by the Crown to assist the B. of a diocese who is prevented from performing his duties properly either by physical infirmities or owing to the extent of the diocese. In the Eng. Church they are appointed by the Crown on the recommendation of the B. of the diocese.

The Greek Church. The spiritual functions of the B. of the Oriental and Orthodox Churches are the same as those of the B. of the Rom. Catholic Church. The B.s, however, are all chosen from the monastic orders, since the secular clergy are compelled to marry before ordination and the B. must be unmarried. See also APOSTOLIC SUCCESSION and EPISCOPACY.

Bishop, beverage of port with halfrances stuck with cloves heated until its vapour can be ignited and the wine served aflame.

Bishop Auckland, tn in B. A. parl. div., Durham co., England, some 10 m. SW. of Durham city. In the NE. of the tn is the bishop's palace, originally built by Anthony Beek in the time of Edward I. There are a number of fine buildings, including the par. church and the tn hall. It is a railway centre and the pop. is chiefly employed in the collieries which surround the tn. Pop. (urban) 35,650.

Bishop Rook, see ROSEVEAR.

Bishops, the Seven, B. who, called together by Sancroft the primate, signed (1688) at Lambeth a protest against the Declaration of Indulgence issued by James II, declaring it illegal. The 7 B. were committed to the Tower on a charge of seditious libel. At their trial, in spite of the fact that everything had been done to secure a committal, the jury passed a verdict of 'not guilty.' See JAMES II.

Bishop's Castle, mkt tn of Shropshire, England situated some 20 m. SW. of Shrewsbury, and about 10 m. NW. of Craven Arms, to which it used to be connected by a branch railway. Formerly an important tn of the marches of Wales, it returned 2 members to Parliament until the passing of the Reform Act of 1832. It is now included in the S. parl. div. of Shropshire. It has lost its former importance, and the anc. castle of the bishops of Hereford, from which it originally derived its name, has fallen into ruins. Area 1887 ac. Pop. 1302.

Bishop's Hatfield, see HATFIELD.

Bishop's Ring, name given to a peculiar tinge in the heavens, a corona or halo near the sun, called after its first observer, Bishop, who noticed it at Honolulu in the autumn of 1883, after the great volcanic eruptions at Krakatoa (Malay Archipelago). Its colour is bluish-white in the centre, shading off to reddish-brown. The diameter of the inner part was about 21', of the outer 45'. The ring was oval in shape, the phenomenon, associated with the twilight glows and coloured suns (blue, green, silvery, and coppery) that were visible in tropical parts after the eruption, being a diffraction corona due to the dust particles ejected from the volcano. The B. R. was most intensely brilliant in the spring of 1884, then it declined gradually, disappearing entirely

in June 1886. The same phenomena were visible again after Mt Pelée's eruption in Martinique (W. Indies), 1902. See Symons, *Eruption of Krakatoa and Subsequent Phenomena*, 1888.

Bishop's Stortford, mkt tn of Herts, England, 29½ m. NE. of London. In the late Saxon and early Norman days it was the property of the Bishop of London; the ruins of the so-called Bishop's Prison are still to be seen. B. S. College is a boys' public school, and there is a girls' high school. It is chiefly employed in brewing and malting; holds important horse and cattle fairs. Pop. 13,270.

Bishop's Waltham, tn of Hants, England, some 10 m. SSE. of Winchester, and originally in the see of Winchester, though now in the Portsmouth diocese. The Bishop's Palace, built by Henry de Blois, was completely ruined during the civil war (1644). Pop. 2900.

Bishop's Weed (*Aegopodium podagraria*), species of Umbelliferae naturalised in Britain. It is also called gout-weed, goat-weed, ground elder, and herb Gerard.

Bishopwearmouth, see SUNDERLAND.

Bistun, see BEHISTUN.

Biskra, tn of Algiers about 120 m. SW. of Constantine, with which it is connected by rail. The climate in the winter months is delightful and B. is a favourite resort for Europeans. Pop. (1946) 19,215.

Bisley, par. of Surrey, England, 7 m. NNW. of Guildford, and 2 m. N. by W. of Brookwood station. B. is chiefly remarkable for the fact that since 1890 the National Rifle Association (q.v.) have held their ann. meeting (see RIFLE SHOOTING) at the ranges on B. Common. Pop. 1300.

Bismarck, Otto Eduard Leopold, Prince von Bismarck-Schönhausen, Duke of Lauenberg (1815-98), Ger. statesman, b. Schönhausen, near Stendal, of an impoverished but ancient Junker family. Though all his life he stressed his Junker connections, he was in fact much influenced by his mother, a clever sophisticated woman with intellectual pretensions, whose romantic temperament he inherited. After attending Göttingen Univ. (where he fought sev. duels) he passed the examinations necessary for a career in the diplomatic service, but then spent some years travelling abroad and on his family estates. He married in 1847. By this time he was already known as a fervent anti-liberal, although he was subsequently to use Ger. liberalism to help him carry out his basic aim—the unity of Germany under Prussian leadership. All his life B. was to show himself a supreme opportunist, ready to use any movement, liberal or anti-liberal, when it suited his immediate objective, and to discard it just as quickly when it had served its purpose. He was Prussia's representative from 1851 in the Frankfurt Diet, and soon became the dominant figure there. It was during this period that he became finally convinced that Prussian greatness was conditional on Austria's eclipse as a great Ger. power. He became Prussian ambas. in St Petersburg in 1858, and was later made minister in Paris. But in

1862 he was recalled and appointed minister-president of Prussia.

He faced a hostile legislature, and at first his early resignation seemed inevitable. In fact, he was to hold office for 28 years. He stormed and bullied to carry through his policy of reorganising the Prussian state to ensure its efficiency in the future wars of unification which he later said he had considered inevitable, and which he had certainly hoped for; and his emotional approach carried the day. Events played into his hands. In 1864 B. joined with Austria in a war against Denmark which paved the way



OTTO VON BISMARCK

for the ultimate annexation of Schleswig-Holstein with Prussia. Two years later, with France and Italy favourably disposed to Prussia, he picked a quarrel with Austria. Austria's defeat at Königgrätz was the end of Austrian predominance in Germany. The states of N. Germany were formed into the N. Ger. Confederation (q.v.) under Prussia's leadership (1867); but the S. states still stood aloof. Only fear of France would drive them to acknowledge Prussian supremacy.

Again B. was able to profit from the blunders of his opponents. Between 1867-70 France and Prussia seemed on the brink of war more than once: B. later claimed that he had all along considered a Franco-Prussian war inevitable, and had deliberately precipitated it by his suppression of parts of the famous 'Ems telegram,' but modern critics have suggested that events in 1870 possibly took B. more by surprise than he admitted. The Prussian military machine was ready, however, and during the war which followed on the pub. of the telegram B.

accompanied the army, conducted negotiations with the French, and completed the arrangements for the entrance of the S. Ger. states into the Ger. federation. By 1871 France was crushed, and a Ger. empire, with the Prussian king as its emperor, was the greatest power in continental Europe.

This was the moment of B.'s greatest personal triumph. From 1871, with the title of chancellor, he concentrated on consolidating the Ger. Empire internally. His centralising policy met with opposition from the Catholic Church and the Socialists: against the Catholics he had little success, but he combated Socialism by a programme of state-controlled social reform which became a European model. His foreign policy aimed continually at Fr. isolation and to this end he allied with Austria and Italy (the Triple Alliance, 1882) and sought an understanding with Russia. In 1878 he presided over the Congress of Berlin (q.v.): at this time his prestige in Europe was enormous. In 1888, however, the Emperor William I d. and B. and the new Emperor William II, soon quarrelled. In 1890 B. was dismissed, and though there was a formal reconciliation in 1893, B. never held office again.

He had once declared: 'It is not by speechifying and majorities that the great questions of the time will have to be decided . . . but by blood and iron.' He himself in his memoirs fostered this impression of himself as a man of iron will, utter ruthlessness, and studied purpose, and it has only been questioned seriously in recent times; when more importance has been laid on the blunders and weaknesses of B.'s rivals and enemies, both inside and outside Germany, on B.'s basically emotional temperament, and on his extraordinary political luck. It remains true, however, that even if he was not the creator of events he held himself to be, he was able to profit by them skilfully and unscrupulously, and in so doing was the prin. architect of the Ger. Empire 1871-1918, his policies exercising an influence on Ger. and European hist. long after the Empire he had built had ceased to exist. See B.'s memoirs (Eng. trans. *Bismarck: His Reflections and Reminiscences*, 1898). See lives by C. Grant Robertson, 1918, E. Ludwig (trans.), 1930, and A. J. P. Taylor, 1955. See also J. V. Fuller, *Bismarck's Diplomacy at its Zenith*, 1922, and A. J. P. Taylor, *The Struggle for Mastery in Europe, 1848-1918*, 1954.

Bismarck, co. seat of Burleigh co., and cap. of the state of N. Dakota, U.S.A. It is situated on the l. b. of the Missouri, on the N. Pacific railway, and is a railroad junction. It has an altitude of 1670 ft above sea level, and is the head of the navigation of the Upper Missouri. There are coal-mines, and the manu. of optical equipment, concrete products, and farm machinery; it ships farm produce, dairy products, wool, corn, and honey. Pop. 18,840.

'Bismarck'. The Ger. battleship, given officially as of 35,000 tons, and said to have been a 50,000-ton vessel, and in 1941

the largest and newest of Ger. warships; centrally controlled; said by the Germans to be unsinkable; carrying a great armament and over 2000 men; sunk on 27 May 1941 by units of the Royal Navy after a pursuit lasting nearly 5 days over a distance of 1750 m. The *B.* was first sighted in the Denmark Strait between Iceland and Greenland on 23 May, and was sunk about 400 m. due W. of Brest. The only damage to the Brit. ships—apart from the loss of the *Hood* (q.v.)—was slight damage to the *Prince of Wales*. During the pursuit successive torpedo attacks were made both by aircraft of the Fleet Air Arm and by destroyers. These succeeded in slowing up and finally crippling the *B.* Naval units taking part included forces from the Home Fleet, from Gibraltar, and ships engaged on convoy duties in the Atlantic. She was eventually sunk after being hit by 8 or 9 torpedoes, and there were only about 100 survivors. Had the *B.*—which was accompanied for some time by a 10,000-ton cruiser, *Prinz Eugen*—escaped, her raiding potentialities would have been a very grave menace to allied shipping, the losses of which at this time were already nearly 500,000 tons monthly. Following the loss of the *Hood*, it was imperative to restore the balance, and the pursuit and sinking of the great Ger. battleship, which was on its first ocean voyage, was a triumph of Brit. sea and air power. Precisely why the *B.* had sailed into the Atlantic is not certainly estab., but the mere presence of so powerful a ship in the Atlantic, where it might, at any moment, make its appearance off Iceland, Greenland, or the West Indies, would have profoundly altered Brit. naval dispositions in all oceans. The pursuit demonstrated, not only the importance of sea-power, but the value of reconnaissance aircraft, without whose co-operation the *B.* would not have been located. The *B.* and attendant cruiser—which latter succeeded in escaping to Brest—were first located by Brit. aircraft in Bergen harbour. After they had reported her departure the *Norfolk* and *Suffolk* (cruisers) took up positions in the Denmark Strait, but owing to snow, sleet, and mist it was difficult to keep her in sight. The 2 Brit. cruisers successfully shadowed her during the night of 23 May. Other ships now took up dispositions at high speed in order to intercept the *B.* and bring her to action. Early on 24 May the *Hood* made contact and in the ensuing engagement the *B.* was at one time seen to be on fire. The *Hood* then received an unlucky hit in the magazine at 13 m. range, and blew up. Despite the efforts of the *B.* to shake off the *Norfolk* and *Suffolk* those ships maintained touch. On the evening of the 24th the *Prince of Wales* (battleship) joined action for a short time, but the Ger. ships turned away and swung round on a southerly course. Other Brit. naval forces were now coming up, and during the night naval torpedo-bombing aircraft from the *Victorious* delivered an attack from a considerable distance, 1 torpedo being seen to hit the

B. After 3 a.m. on 25 May, the Brit. ships lost touch with the enemy owing to low visibility, the *B.* being then 350 m. SSE. of S. Greenland. The main body of the Home Fleet, including the new battleship *King George V.*, was now steaming at a high speed in a south-westerly direction from N. waters, while another force, including the *Rodney* (battleship) and *Ramillies* (battleship), which were escorting convoys, proceeded also to converge in the direction taken by the *B.* Extensive air searches were organised by the Coastal Command aircraft, and by the Canadian Air Force stationed at Newfoundland; and at about 10.30 a.m. on 26 May the *B.* was again located, by a Catalina flying-boat, about 650 m. W. of Land's End. The Catalina was attacked by the *B.* and lost touch, but at 11.15 a.m. the *B.* was again spotted by naval aircraft from the *Ark Royal* carrier. The *Prinz Eugen* had, however, parted company, and was not seen again. The cruiser *Sheffield* was now detached to shadow the *B.* Another force of naval aircraft now attacked, and torpedoes were seen to hit the *B.* amidships, and on the starboard quarter. The *B.* now slowed round in 2 complete circles, with her speed much reduced. Between 1.20 and 1.50 a.m. on 27 May the *B.* was attacked with torpedoes striking the ship and causing a fire on the fore-castle. She now appeared to be stopped, having sailed 1750 m., and being 400 m. due W. of Brest—where but for the skill and persistence of Brit. aircraft she might soon have joined the *Gneisenau* and *Scharnhorst*. For the greater part of 25 and 26 May the *B.* had been lost to the Brit. fleet, and they were afraid they had lost her altogether. It was only in the teeth of a howling gale and with the flight deck wet with flying and treacherous spume and the ship plunging and rearing in tremendous seas that Swordfish torpedo-bombers look off from the *Ark Royal* and hit the *B.* with 2 vital torpedoes that sensibly reduced her speed; and but for the urgent need of crippling the battleship to enable the Brit. capital ships to close and bring her to action not a single aircraft would have been allowed to take off. During the night of 26 May and in the early hours of the following day Brit. warships were all round the doomed Ger. ship, the courage and tenacity of whose crew, who went on fighting when their position was hopeless, were outstanding. At dawn the Brit. ships closed in in squalls of rain to within 13 m. The *B.* was now yawing from side to side, and scarcely under control; but she was still capable of fairly accurate salvos. After 15 min. of terrible punishment her fore turret went out of action with the guns cooked up uselessly in the air. There was a great fire raging amidships. With bombs and torpedoes from the air and torpedoes and gun-fire from the ships, the Brit. fleet closed in still nearer on the *B.*, which, with her steering-gear destroyed, was now circling at 12 knots out of control. But she would not strike her colours, and, finally, the capital

ships having sailed away, the *Dorsetshire* was detailed to dispatch her. The cruiser, creeping cautiously across the *B.*'s bows, 2 m. distant, passed down the port side, and fired her torpedoes. The *B.* was now hidden in huge clouds of smoke, through which, amidships, was the glare of flames. The torpedoes took her. There was a tremendous explosion under water, and the *B.* listed to an angle of 45 degrees, steadied for a moment, then heeled right over and slid beneath the waters.

Bismarck Archipelago, group of is. which lie to the NW. of the Solomon Is., and to the N. of the E. extremity of New Guinea. Their former name was New Britain Is., and they were discovered by Dampier in 1699, but in 1885 Great Britain came to an agreement with Germany by which they were assigned to the Ger. sphere of influence, and their names were then changed. In Sept. 1914 they were occupied by an Australian force, and were temporarily under military rule. Since then they have formed part of the Australian mandated ter. of New Guinea. The prin. is. of the archipelago are New Britain (q.v.), formerly called Neu Pommern (area 15,000 sq. m.), and New Ireland (q.v.), formerly called Neu Mecklenburg (area 3000 sq. m.), which are separated from each other by St George's Channel, in which the currents are of great violence and subject to no fixed rules; Vitiaz Strait separates New Britain from New Guinea, and another important is., Lavongal, formerly Neu Hannover (area 530 sq. m.), lies off the north-western extremity of New Ireland, from which a tortuous system of reefs separates it; Duke of York Is. (area 22 sq. m.) and the Admiralty Is. (area 600 sq. m.) are also important. The archipelago, which is of coral and volcanic formation, is mountainous and well wooded. In New Britain, the interior of which is but little known, there are sev. active volcanoes. It is practically undeveloped, the only plantations being around the coasts. Coco-nuts are the chief crop, but coffee and cocoa have recently been planted. The is. has many fine but little used harbours, the chief being Simpson Harbour on Blanche Bay. New Ireland has been more thoroughly explored than New Britain. It is no longer actively volcanic, but in other respects is similar to the larger is. The chief in. is Kavieng, on the N. coast of Nusa Harbour. The climate of the archipelago is, on the whole, healthy, and the soil is very fertile. Cotton plantations were started by the Germans with native labourers. The inhab. of the is., mostly Papuans, are skilled in agriculture. Coco-nut fibre, copra, cotton, rubber, coffee, tortoiseshell, trepang, mother-of-pearl, and fruit are the chief articles of trade. Shells threaded on long strips of split cane form the money used by the natives. Total area 19,200 sq. m. The native pop. is about 155,000. It was occupied by Japan during the Second World War. For details of operations see PACIFIC CAMPAIGNS, OF FAR EASTERN FRONT, IN SECOND WORLD WAR.

Bismuth, metallic element. It was probably known in the Middle Ages under the name *marcasite*, but was often confused with zinc and antimony. It is a comparatively rare metal, usually occurring in nature in association with ores of silver and cobalt. The greater part of the world's supply comes from Schneeberg in Saxony, Joachimsthal in Bohemia, Cornwall, Bolivia, and Peru. The ore is roasted and then smelted with iron, carbon, and slag; 2 layers are thus obtained, the lower one containing nearly all the B., which may be removed by tapping the lower end of the cylindrical retort in which the process is carried out. The crude B. is then purified by heating it on an inclined iron plate, when the pure B. melts and runs down into the receptacles provided. B. is a hard brittle metal with a reddish-white colour; its sp. gr. is 9.75, it melts at 271° C., and expands as it solidifies. It burns with a bluish flame and readily oxidises at ordinary temps.; it also combines directly with sulphur and with elements of the chlorine group. B. forms many useful alloys with low melting-points under the general name of fusible metal. These alloys are used in making type metal, as their property of expanding on solidification serves to produce a good cast; for soldering, and for the manuf. of safety plugs in boilers, as the constituents of the alloy can be so arranged as to provide a melting-point at a particular temp. B. forms 4 oxides, of which the yellowish trioxide is the most important. Two chlorides, 2 sulphides, and a sulphate may also be prepared. Most valuable of the B. compounds is the nitrate together with the basic nitrates formed by diluting the acid solution with water; magistery of B., flake white, and Sp. white are some of the salts thus produced. The basic carbonate prepared by treating B. nitrate with ammonium carbonate is used in medicine for easing painful gastric affections, such as dyspepsia, diarrhoea, ulcers, and cancer. The action is that of a direct sedative, the salts coming into contact with the nerve-endings of the mucous membrane. The insoluble salts are opaque to X-rays and abnormalities in the structure of the alimentary canal can be demonstrated on a fluorescent screen by following the course of a large dose taken as an emulsion. Sodium bismuthate is an analytical reagent, used as an oxidising agent, e.g. in the estimation of manganese in steel.

Bison, name of a ruminant allied to the ox in the family Bovidae, comprising only 2 species, the European and the Amer. B.s. The European B. (*B. bonasus*) is often confused with the aurochs, and is now to be found only occasionally in Europe, as in the forest of Byelovitsa (Bialowicza) in Lithuania. It is more than 6 ft high at the shoulders and is a most powerful and formidable animal, able to level with a thrust a tree 6 in. in diameter. It is massive, has thick, elongated withers, and its head is covered with a mane, often a foot in length, which is thickest in winter and inconspicuous

in the females; the eyes are small and savage. It has a strong sense of smell and can be approached only from the leeward. In habit it is herbivorous and fond of the barks of trees; it is gregarious, but domestic cattle rouse its fury, and it attacks them fiercely; attempts to mix the breed have failed. A short deep grunt is its method of articulation, and can be heard at a considerable distance. The Amer. B. (*B. bison*) differs little from the European B., but is smaller, shaggier, and fiercer. See **BUFFALO**. It is gradually becoming extinct, but in a few places, such as Yellowstone Park, herds are preserved.

Bissagos Islands, group of is. off the W. coast of Africa, consisting of about 16 large and a number of small is.

Bisschop, Christoffel (Christoph), (1828-1904), Dutch genre-painter, b. Leeward. He was a pupil of Comte and Gleyre in Paris. After an early historical subject painting 'Rembrandt going to a Lecture on Anatomy,' 1867, he settled down to depict popular life in Friesland.

Bissell, George Edwin (1839-1920), Amer. sculptor, son of a marble-cutter, b. New Preston, Connecticut. He served during the Civil war (1862-5). In 1875 he went to study in France and Italy. Among his chief works are a national monument at Waterbury, Connecticut, a statue of Abraham Lincoln at Edinburgh, a relief of 'Burns and Highland Mary' at Ayr, and emblematical groups at New York, Buffalo, St Louis, and elsewhere.

Bissen, Herman Wilhelm (1798-1868), Dan. sculptor, b. Slesvig, and educ. at Rome under Thorwaldsen, who on his death left instructions in his will that B. should finish his uncompleted works. B. was in 1860 appointed president of the Academy of Fine Arts at Copenhagen. Among his chief works are: 'Cupid sharpening his Arrow,' 'Valkyrie,' an 'Apollo,' and a 'Venus.' One of his most famous works, 'Orestes,' perished in the fire at Copenhagen, 1884.

Bissextile, or **Bisextus Dies**, see **LEAP YEAR**.

Bissing, Moritz Ferdinand von (1844-1917), Ger. general. Appointed Gov.-General of Belgium in 1915, in succession to Field Marshal von der Goitz. Perpetuated the arbitrary gov. of his predecessor and introduced a new judicial system, under which all idea of the personal safety of the populace was destroyed because military commanders had the power to inflict punishment on innocent persons when the guilty could not be found. B. will probably be notorious chiefly as the official who signed Nurse Cavell's death warrant.

Bissolati-Bergomaschi, Leonida (1867-1920), It. Socialist, b. Cremona, and educ. at Pavia univ. He became a lawyer, and joined the Socialist party formed in 1892; he was the first editor of the Socialist paper *L'Avanti!* B.-B. entered the Chamber of Deputies, 1897. He seceded from the Socialist party in 1911 and formed the Reformist group. B.-B. entered (without portfolio) the Boselli

gov., 1916; remained under Orlando minister of pensions; resigned, 1918.

Biston, in entomology, name given by Dr Leach to a genus of lepidopterous insects of the family Geometridae. Three Brit. species of these moths are *B. prodromaria*, the oak beauty; *B. betularius*, the pepper moth; *B. hirtarius*, the brindled beauty.

Bistre, warm brown-coloured pigment, which is prepared generally from beech-wood soot, and was used by many old masters in their drawings.

Bitche (Ger. Bitsch), Fr. tn in the dept of Moselle, in a pass of the Vosges. Its citadel, hewn out of a precipitous rock, resisted the Prussians in 1793, 1815, and 1870-1. It has glass and ceramic manufs. Pop. 3500.

Bithur, tn in Uttar Pradesh, India, about 15 m. N. of Cawnpore. Interest in the tn is due to the fact that Nana Sahib made it his headquarters in the mutiny of 1857. Havelock stormed and captured the tn in July 1857, when the palaces of the Nana were destroyed.

Bithynia, anct div. of Asia Minor separated from Europe by the Propontis and the Bosphorus, and bounded on the N. by the Black Sea. On the E. it adjoined Paphlagonia, on the W. and SW. Mysia, and on the S. Phrygia. It is mountainous and well wooded, but near the sea coast there are many fertile valleys. Its natural sources of wealth are not yet fully developed, although its forests provide the material for an excellent and flourishing industry, and coal is also known to exist in the country. The Bithynians are supposed to have been of Thracian origin. They became part of the Lydian monarchy under Croesus, and later were conquered by the Persians (546 bc). B. became, however, ultimately one of the most flourishing of the smaller kingdoms of Asia Minor, its cap. Astacus, a Megarian colony, being rebuilt and called Nicomedia by Nicomedes I (c. 280 bc). The last king, Nicomedes IV, made the Romans his heir in 74 bc. It became a Rom. prov., and for some time under Trajan was governed by the younger Pliny. In 1298 the Turks under Osman invaded the country, and it became in the course of time a Turkish possession. The sole flourishing tns at the present time are Prusa (Brusa, q.v.), Iznid (q.v.), (Nicomedia, q.v.), and Soutari (q.v.).

Bitlis, tn in il of Bitlis, Turkey, situated on a trib. of the Tigris, in a high valley, 4700 ft, amid the wild mt scenery W. of Lake Van. An old Arab castle is said to occupy the site of a fortress built by Alexander the Great. The prin. industry is the weaving of red cloth. Tobacco is largely grown, and there is a trade in gum and fruit. Pop.: il, 88,000; tn, 11,000.

Bitola (Turkish Monastir; anct Heraclea Lyncestis), tn in Macedonia, Yugoslavia, in the strategic Monastir Gap, at the junction of the main N.-S. and E.-W. roads of the S. Balkans. It has many interesting buildings, including an anct mosque. It was taken from the Turks by the Serbs in 1912, during the Balkan

War (q.v.). B. has a large trade in agric. produce, tobacco, and wool, and manufs. textiles and flitree work. Pop. 31,000.

Biton and **Cleobis**, sons of Cydippe, a priestess of Hera at Argos. In their love for their mother they dragged her chariot to the temple of Hera, 45 stadia, or nearly 6 m. The mother prayed Hera to grant them the best that mortals might have, and they died in the temple while asleep.

Bitonto (anct Butuntum), It. tn, in Apulia, 10 m. W. of Bari (q.v.). It has anct walls, and a fine 12th-cent. Romanesque cathedral. There is a trade in agric. produce, wine, and olives. Pop. 34,900.

Bitter Apple, **Bitter Cucumber** (*Citrullus colocynthis*), fruit of a species of Cucurbitaceae. It is a round, yellow fruit, and the pulp is used as a purgative under the name of colocynth. Other names for it are colocynth gourd, and colocynthia.

Bitter Lakes, known as the Great and the Small, form part of the Suez Canal. These lakes were 25-40 ft below sea level, but were almost dry when the canal was cut.

Bitter Vetch, see LATHYRUS.

Bittercress, see CARDAMINE.

Bitterfeld, Ger. tn in the dist. of Halle, on the Mulde, 18 m. NE. of Halle (q.v.). It is in an important lignite-mining dist., and has metallurgical, chemical, and textile industries. Pop. 33,000.

Bitterling (*Rhodeus amarus*), small species of cyprinid fish found in the freshwaters of Central Europe. The breeding female has a long tube down which the eggs are laid in the gills of freshwater mussels. When the young are hatched they bear in their skin the encysted embryos of the mussel and these eventually leave their fish carrier.

Bittern, wading bird, buff-coloured, speckled with black and tawny brown, living in swampy ground. It has a short neck and long bill; its habit of holding neck and bill in a vertical position conceals it among the reeds, where it rests by day, hunting its food—frogs, reptiles, and fish—towards nightfall. Its loud booming call marks the breeding season. The genus *Botaurus* belongs to the family Ardeidae, which includes the herons. The European B. (*Botaurus stellaris*) is rarely seen now in Great Britain, but it was once common, especially in the Fens. The bird has been reintroduced into Norfolk, especially in the Broads, where its booming note was once a feature of those haunts.

Bitterroot Mountains, range of mts, with a maximum altitude of between 9000 and 10,000 ft, forming part of the boundary between Idaho and Montana, U.S.A. It is an outlying part of the Rocky Mt system, branching off S. where the main range turns E. through Montana.

Bitters, alcoholic infusions of anct roots, barks, and herbs, variously flavoured, which are regarded as whetting the appetite and stimulating the digestive organs. The best known and strongest is Angostura (q.v.), which dodged Prohibition in the U.S.A. as a 'medicinal bitter.' Others are Amer. Picon (Fr.),

one of the many forms of orange B., Campari and Fernet-Branca (It.), and peach B.s made in England from peach kernels.

Bitterspar, general name for the crystallised varieties of dolomite, or magnesite limestone (q.v.). It possesses various degrees of transparency, and has a pearly lustre, whence it has been called pearlyspar.

Bittersweet, or 'woody nightshade,' *Solanum dulcamara*; it derives its name from the taste, which is first bitter and then sweet. It is found in hedges and thickets, with a slender climbing stem, pointed leaves with 2 projections at the base; the flowers, resembling those of the potato, are lilac-coloured with yellow centres. The scarlet fruit, growing in clusters, is poisonous.

Bitterwood, common name given to various trees such as *Xylocopa glabra* of W. Indies, family Annonaceae; Chinese *Picrasma ailanthoides*, family Simarubaceae; and *Simaruba amara*, family Simarubaceae; all yielding very bitter bark.



E.N.A.

BITTERNS

Bitumen, name sometimes loosely applied to naturally occurring hydrocarbons in general, in its narrower sense denotes a solid or viscous non-crystalline material derived from petroleum (q.v.), which is soluble in carbon disulphide. B. is black or brown in colour and has adhesive properties. Chemically, the various types of B. consist largely of the aromatic or naphthenic hydrocarbons (q.v.) together with traces of sulphur, nitrogen, and oxygen compounds. B. is usually produced commercially as an extract or distillation residue from certain petroleum; various types also occur naturally. The natural B.s include elaterite (q.v.), found in Derbyshire; manjak or glance-pitch, which occurs in Barbados and is similar to B.s from Trinidad and Colombia; wurtillite and gilsonite or untaite from Utah and Colorado, U.S.A.; albertite

from New Brunswick; grahamite, with a relatively high carbon content, found in various parts of the U.S.A., Mexico, and Cuba; and the very high carbon-content impsonite of Oklahoma, Arkansas, and Nevada, U.S.A. The crude petroleum suitable for the manuf. of B. include those from Mexico, Venezuela, California, and Egypt, all of which have a high content of the appropriate range of hydrocarbons. The most important application of B. is in roadmaking, for which purpose it may be supplied either as an emulsion with water or as a 'cutback' consisting of B. blended with a solvent such as kerosene or creosote. B. has been used for 5000 years as a mortar and waterproofing material in building construction. To-day, in addition to its many applications in civil engineering, B. is used in the manuf. of roofing-felt and waterproof paper, and for the insulation and protection of electric cables and pipelines.

Bituminous Coals, see COAL.

Bituriges, Celtic people of ant. Gaul. They were divided into the B. Cubi, whose cap. was Avaricum (Bourges), and the B. Vivisci, cap. Burdigala (Bordeaux). The former joined in the rebellion of Vercingetorix (52 BC), their cap. was taken by the Romans, and its people massacred.

Bitzius, Albert (1797-1854), Swiss novelist, usually known by his pseudonym, Jeremias Gotthelf, the name of the prin. character in his first novel *Bauernspiegel*. He was the son of a pastor, and from 1831 till his death was himself pastor at Lützelfüh, in the Upper Emmenthal. His novels, in which, with crass realism, he describes Swiss peasant life, include *Bauernspiegel*, 1837, *Leiden und Freuden eines Schulmeisters*, 1838, *Uli der Knecht*, 1841, and its sequel, *Uli der Pächler*, 1849, *Käthi die Grossmutter*, 1847, and *Erlebnisse eines Schuldenbauers*, 1854.

Bivalves, *Pelecypoda*, or *Lamellibranchia*, one of the largest groups of molluscs, characterised by their 2 bilaterally symmetrical, limy plates or valves to the right and left of the body. The mantle secretes a covering over the whole outer surface, and this forms at the dorsal middle line an elastic membrane, called the hinge-ligament, which connects the 2 valves. The body of this mollusc is itself bilaterally symmetrical and is compressed; the head is rudimentary; the foot is usually present, when it is ploughshare-shaped, may contain some of the viscera, and has often a byssus (q.v.) gland which serves in the attachment of the animal. The nervous system consists of 3 pairs of ganglia: there are no jaws or tongue, and a short oesophagus leads to the stomach; respiration is mainly effected by means of 2 ctenidia, which are developed right and left of the elongated body. Tracts of cilia on the ctenidia create ingoing currents bringing minute plants and animals and organic debris into the mantle cavity. This food material is conveyed by other cilia to the labial palps and mouth. The heart consists of a ventricle and 2 auricles, and the reproductive organs occur in the foot, the sexes being usually distinct. B.

are found all over the world and more than 11,000 species are known to exist. They live chiefly in the sea, where they are found at all depths, but some inhabit fresh water; muddy and sandy shores are those which they prefer. Nearly all feed on vegetable matter, but the Septibranchia, a wholly marine order, are carnivorous. Many remain attached to one spot during life, others can crawl slowly, while others again swim by opening and shutting the valves of their shell. Some, e.g. *Teredo*, are boring animals, and have a damaging effect on the wood of ships. They are of use to man in various ways: some are edible, e.g. mussels, cockles, oysters; savages use the shells in place of coins; pearls are obtained from oysters, and mother-of-pearl is of value commercially; many B. are used as bait in deep-sea fishing. In the classification of Lamellibranchia zoologists are divided, but most agree in grouping them into 4 orders: Protobranchia, with gill-filaments flattened and not reflected, e.g. *Foldia*; Filibranchia, with long, reflected gill-filaments, united by ciliary junctions, e.g. mussels; Eulamellibranchia, with branchial filaments united by interfilamentar and interlamellar junctions, both vascular, e.g. clams, cockles, freshwater mussels; Septibranchia, with gills transformed into a muscular septum, e.g. *Poromya*.

Bivouac (from Ger. *Beiwache*: bet, by, and wache, watch), military term for a temporary encampment. No tents are used, and each soldier remains fully dressed, with his arms close at hand. At first only the guards had to B. while the rest of the army remained in camp, but since the time of the Fr. Revolution it has been customary for forces actually engaged or about to be engaged in conflict to B. This enables them to dispense with tents and all encumbrances, and facilitates speedy action. Temporary protections of straw and branches are erected if possible, and the position is chosen so as to afford as much protection from the weather as can be obtained. There are various plans for B.s, according to the regiment and occasion, but the chief object always is that all should be as ready for action as possible.

Biwa Lake, largest lake of Japan, in Shikoku, Honshu. It is 36 m. long, 12 m. broad, and is famous for its beauty, especially at the S. extremity. B. L. is 10 m. by water from Kyoto, drained by R. Yodo, and connected with R. Kamo by the Lake B. Canal. The water is used for drinking, as well as for the factories and mills of Kyoto.

Bixa Orellana, only species of its genus, family Bixaceae, native to the W. Indies. It is an evergreen tree, which bears seeds covered with a soft, sticky, vermilion-coloured rind, which furnishes the annatto (or annatto) of commerce, used in dyeing confectionery.

Bixby, William Herbert (1849-1928), Amer. military engineer, b. in Charlestown, Massachusetts. After graduating in 1873 at the U.S. Military Academy, he joined the Corps of Engineers and became

prof. of engineering at W. Point. In 1880 he went to France and graduated the next year from the École de Ponts et Chaussées. He became an authority on the control of floods, and, later, with the rank of general, was appointed head of the Mississippi R. Commission; also chief of the Engineers, U.S. Army, 1910-1913. In 1912 directed the raising of the U.S.S. *Maine* in Havana Harbour.

Blysk, tn in the Altay Kray of S. Siberia, starting point of a highway to Mongolia. It has engineering, food, and textile industries, and a museum with rich collections on ethnography and the hist. of the Altay Mts area. Pop. (1956) 112,000 (1926, 46,000). It was founded in 1709 as a Russian fortress.

Bizerta, seaport, fortified harbour, and naval station in Tunisia on the N. African coast of the Mediterranean Sea, 42 m. SE. from Toulon and 60 m. by rail NNW. from Tunis. B. was formerly a Fr. Protectorate. In Sept. 1955 Tunisia gained full local autonomy. B. is strongly fortified by coast batteries. The modern tn of B. (Arab. *Ben-zert*), lies N. of the canal, and S. of the Arab tn and the anct citadel. The anct name of the harbour, always the safest on the coast, was Hippo Zaritus or Diarrhytus, once a Tyrian, later a Rom., colony. It was taken by the Arabs in the 7th cent., and by Spain in 1535. Long neglect allowed the fine harbour to decay utterly till the declaration of the Fr. protectorate over Tunis in 1881, and its subsequent rise to importance as a naval station. It was occupied by the Germans during the Second World War, and was retaken by Amer. troops on 7 May 1943. Pop. 39,371 (1903 Europeans). See AFRICA, NORTH, SECOND WORLD WAR CAMPAIGNS in.

Bizet, (Alexandre César Léopold Georges (1838-75), Fr. composer, b. near Paris, the son of a teacher of singing. He studied under Halévy at the Conservatoire, and won the Prix de Rome, 1857, with a cantata, *Cléopâtre et Cléopâtre*. The best of his earlier operas, *Les Pêcheurs de perles*, produced 1863, *La Jolie Fille de Perth* (after Scott), 1867, and *Djamileh*, 1872, suffered in popularity from the charge of 'Wagnerism', reserved at the time with little understanding for all music which appeared to the critics as strange or progressive; the others were neglected or remained unfinished. His music for Alphonse Daudet's drama, *L'Arlesienne*, 1872, was more successful, and has remained a standard work in the form of 2 suites for orchestra. His masterpiece, *Carmen*, 1875, written to an adaptation by Méilhac and Halévy of Mérimée's tale of the same name, at first scandalised Paris by its realism and did not achieve its great popularity until after B.'s death on the night of its 31st performance. His symphony in C, undiscovered till recently, and written when he was 16, is now frequently performed. B. married a daughter of Halévy in 1865. See lives by Pigot, 1886 (revised ed., 1911); Bellaigue, 1891; Weissmann, 1907; D. O. Parker, 1926; Martin Cooper, 1936; Winton Dean, 1948.

Bjærregaard, Henrik Anker (1792-1842), Norwegian author. He was educ. for the law, and became a chief justice. Among his best-known books are *Blonde Digtninger*, 1829-30, and *Digtninger*, 1848; he is also the author of the Norwegian national anthem, *Sønner av Norge*, and an operetta, *Pytteløst*, 1825, which took a high place in Norwegian drama.

Blarkind, Rinnur Benediktsson (1881-1946), Icelandic poetess who ranks among the major poets of her time. She wrote under the pseudonym of *Hulda*. Her poetry is of high lyrical quality and polished in form. She was country-bred and the roots of her verse are rural. She also wrote novels. See R. Book, *History of Icelandic Poets*.

Bjorneborg, see PORI.

Björnson, Björnstjerne (1832-1910), Norwegian dramatist, novelist, and poet, b. Osterdal, son of the pastor of Kvikne. In 1852 he graduated at the univ. of Christiania, where he took to journalism, chiefly dramatic criticism, but soon embarked on his independent literary career. His series of pastoral novels, some of the most exquisite pictures of peasant life in modern fiction, began with *Synnöes Solbakken*, 1857, and include *Arne*, 1858, *En Glad Gut* (A Happy Boy), 1860, and *Fiskerjenten* (Fisher Maiden), 1868. In 1897 he was made director of the Bergen theatre. B.'s dramatic work began with his national saga plays, the earliest being *Mellem Slagene* (Between the Battles), produced 1857, and *Halte-Hulda* (Lame Hulda), 1858. In 1860 he was given a travelling allowance by the gov., and spent from 1860 to 1863 in Italy and on the Continent. *Kong Sverre*, 1861; the great trilogy, *Sigurd Stenbe* (Sigurd the Bastard), pub. 1862; *Sigurd Jorsalfar* (the Crusader), not pub. till 1872, complete his heroic and historical dramas. On his return to Norway he became manager of the theatre at Christiania. His literary reputation was now estab. His tragedy, *Maria Stuart i Skotland*, 1864, and a comedy, *De Nygifte*, 1865, were produced under his management. At this period he threw himself into politics as a strong reformer and radical. From 1868 to 1874 he was constantly travelling, not only in Norway but on the Continent, lecturing on politics, literature, art, and religion. His magnificent voice and noble presence helped his great oratorical powers. In 1870 he pub. his collection of poems, *Digte og Sange*, and his epic, *Armijot Gelline*. From 1873 to 1876 he lived abroad, and did not return to Norway till 1877. His third literary period may be dated from this time; it is marked by a complete change, and B. takes his place with Ibsen as one of the pioneers of modern drama with a direct appeal to life as it is actually lived, and with a close insight into the motives of everyday action. These plays were at first unsuccessful, though they excited much controversy; they include *En Fallit* (A Bankruptcy), 1874, *Redaktøren* (The Editor), 1874, *Kongen* (The King), 1877, *Det nye System* (The New System), 1879,

and *Geografi og Kaerlighed* (Geography and Love), 1885. His symbolic play, *Over Aeneas* (Beyond our Powers), was pub. 1883, but not produced till 1899. In the political crisis over the royal veto he supported Sverdrup with his old vehemence, and for a time he lived abroad and wrote the analytical and psychological novels, dealing with heredity and education, *Det Flager i Byen og paa Havnen*, 1884, and *Paa Gud's Vej*, 1890. A collection of powerful stories (*Nye Fortaellinger*) was pub. in 1894. His later work includes the plays *Paul Lange*, 1898, *Laboremus*, 1901, *Paa Storchens*, 1904, *Daglannet*, 1904, and *Naar den nye Vin blomstrer*, 1909. He received the Nobel prize for literature in 1903. Though an ardent nationalist he adopted a moderate policy during the rupture between Norway and Sweden. See O. Collin, *Björnson* (2 vols., 2nd ed.), 1924; G. Brandes, *Ibsen and Björnson*, 1899; O. Gjerløff, *B. Björnson*, 1932; H. Larson, *B. Björnson, A Study in Norwegian Nationalism*, 1944. There is a short memoir and full bibliography by R. F. Sharp in *Three Comedies by Björnson* (Everyman's Library).

Björnsson, Gudmundur (1864-1937), director-general of medical service in Iceland from 1908 to 1931, and the greatest 20th-cent. social reformer in that country. He was uncommonly gifted, a man of high ideals and boundless energy, far-seeing and practical, a brilliant writer and speaker, and an original poet. In 1894 he was appointed medical officer of Reykjavik and embarked upon a campaign of reforms which he relentlessly maintained until his health broke down 3 years before his death. He left no aspect of the national life untouched. The greatest visible results are those of his fight against tuberculosis, which was at one time a national scourge, and of his work for the National Life-saving Association, which he founded in 1928 and of which he was the first president.

Björnsson, Sveinn (1882-1952), Icelandic politician, diplomat, and the first President of the Rep. of Iceland (1944-52), son of Björn Jonsson (q.v.).

Björnstjerna, Magnus Frederik, Count (1779-1847), Swedish diplomat, b. Dresden; he joined the Swedish army and fought against the French at the battle of Leipzig, and later served in Holstein. In 1814 he signed the treaty uniting Sweden and Norway. He was minister plenipotentiary to Britain, 1828-46.

Black, Adam (1784-1874), publisher, b. Edinburgh. First apprenticed to book-selling in London, he estab. in Edinburgh, 1807 (being later joined by his nephew Charles B.), the still flourishing publishing house of A. & C. Black. He was twice Lord Provost of Edinburgh, and M.P. for the city from 1856 to 1865 as a Liberal. His firm owned the *Encyclopaedia Britannica*, 1827-1901, publishing the 7th, 8th, and 9th eds.; they have also pub. *Who's Who* annually since 1897.

Black, Jeremiah Sullivan (1810-83), Amer. statesman, b. Stony Creek, Pa; self-educ., he soon became foremost at

the Bar, and in 1857 was attorney-general in Buchanan's Cabinet. He successfully contested the validity of the Californian land claims, opposed the Congressional plan for reconstructing the Confederate states after the Civil war, and was counsel for President A. Johnson and W. W. Bolknap on their impeachments. There is a life by his son, C. F. Black, 1885.

Black, Joseph (1728-99), Scottish physicist, b. France. After an education in Belfast, he studied medicine and chem. under Prof. Wm Cullen, whom he succeeded in 1756 as prof. of anatomy and chem., a position he later exchanged for the chair of medicine. In 1754 he rediscovered carbon dioxide, the first gas to be discovered other than air. His experiments on heat led to a clearer distinction between heat and temp. He found that different substances had different values of what are now known as specific heat and latent heat (q.v.). In 1766 he became prof. of chem. at Edinburgh, where he d.

Black, William (1841-98), Scottish novelist, b. Glasgow. He studied art with little success, and became a journalist, writing for the *Morning Star*, for which he acted as war correspondent during the Austrian and Prussian war of 1866; he then joined the staff of the *Daily News*. His first novels made no mark, but *In Silk Attire*, 1869, and *Kilmory*, 1870, were more successful; his popularity, however, as a novelist, may be dated from *A Daughter of Helth*, 1871. B.'s special power was that of vivid description of Scottish scenery and outdoor life. His long series of novels includes *The Strange Adventures of a Phaeon*, 1872, *A Princess of Thule*, 1874, *Macleod of Dare*, 1878, *White Wings*, 1880, *Shandon Bells*, 1883, *White Heather*, 1885, *In Far Lochaber*, 1888, *Highland Cousins*, 1894, and *Wild Eelin*, 1898. A lighthouse was built to his memory at Duart Point, Sound of Mull, in 1901. See life by Wemyss Reid, 1902.

Black, see PIGMENTS.

Black Acts, popular name for various enactments: 1. The statutes of the Scottish Parliament, 1424-1594, which were printed in black letter.

2. The Scottish Acts of 1584, passed at the instigation of James VI, to suppress Presbyterianism and re-establish Episcopacy. These acts declared the supremacy of the king, overthrew the jurisdiction of the kirk; the functions of the presbyteries and assembly were handed over to the bishops; it was made treason to attack episcopacy. Abrogated in 1592.

3. An Act of 1722, directed against gangs of men with blackened faces who were responsible for an outbreak of robberies. The Act, which made it a felony to blacken the face, was repealed in 1827.

Black Agnes, sobriquet given on account of her complexion to Agnes, Countess of Dunbar (c. 1312-69), who defended Dunbar Castle against the English in 1338, for 5 months, until reinforcements having reached her by sea, the English withdrew.



T. Fall

BLACK-AND-TAN TERRIER

Black-and-Tan Terrier, original type from which have sprung the Welsh, Irish, and Airedale terriers. The earliest recognisable B.-and-T. T. is portrayed in an illuminated MS. book of hours of the 15th cent. Later they were known as Eng. terriers, and also as Manchester terriers; but there have been many cross-breeds. It is generally accepted that the pure breed had its origin in and around Manchester. Dog shows have conducted to the refinement of the original breed down to the quality of a mere pet, though it is still useful as a rat catcher, besides having great intelligence. The head should be long, flat, narrow, and wedge-shaped; eyes, very small, sparkling, and dark; nose, black; erect or semi-erect ears; neck long, and tapering from the shoulders to the head, with sloping shoulders; narrow and deep chest; legs quite straight; feet more inclined to be cat- than hare-footed; tail thick where it joins the body and tapering to a point; and smooth, short, and glossy coat. In colour the dog should be jet black and rich mahogany tan on the head; the muzzle should be tanned to the nose, which, with the nasal bone, is jet black; forelegs should be half tanned, and the hind legs tanned on the inside, but not on the outside. The toy breed, the only B.-and-T. T. recognised by the Kennel Club, retains much of the quality of the It. greyhound. A dog so small has been known as could stand on the palm of one's hand. The usual weights are: for the large or normal breed, 16-20 lb.; for toy breeds, not exceeding 7 lb.

'Black and White', illustrated weekly, founded in 1891 by Charles Norris Williamson. Beginning as an artistic journal, it became one of the pioneers in photographic illustration of current events, and pub. both drawings and photographs dealing with news and interesting personalities. The literary matter included short illustrated stories and articles on politics, society, sport, and professional subjects. In 1912 it was incorporated with the *Sphere* (q.v.).

Black Ape (*Cynopithecus niger*), species of monkey found in Celebes, related to the macaques. Its hair and skin are coal-black, and it has a crest on the head.

Black Art, see MAGIC.

Black Asizes, name given to certain

assizes at which a virulent epidemic of gaol fever, or typhus, broke out; particularly to one which occurred at the close of the Oxford assizes, July 1577, of which more than 300 persons *d.*, including the high sheriff and many officials of the court.

Black-band Ironstone, in mining and metallurgy, an iron-ore siderite, found chiefly in Scotland; it is a carbonate of iron, mixed with a large proportion of coal or bituminous matter. It is of intensely black colour, and was highly prized for its ease in smelting.

Black Bass, fish, belonging to the sun-fish family, Centrarchidae, of the genus *Micropterus*. It is akin to the perch, has an oblong body, with dorsal fin low and anal fin shorter than the soft part of the dorsal. It is essentially a N. Amer. fish, and the 2 species are *M. salmonides*, which is found from Canada to the Great Lakes and as far S. as Texas; and the small-mouthed *M. dolomieu*, which is found from the Great Lakes to Arkansas and N. and S. Carolina. Other names given to one or both species are trout, in the S., and in the N., chub, Welshman, and jumper.

Black Bear Cat, see BINTURONG.

Black Beetle, see BLATTIDAE.

Black Book: 1. Of the Admiralty, contains, under the title of 'Laws of Oleron,' the earliest collection of 'sea laws,' dating back to the 14th cent. It was first ed. by Sir Travers Twiss, 1871-6, and embraces the various maritime laws and customs on which the Judge in the Admiralty Court bases his decisions.

2. Of the Exchequer, is a meagre record of the royal household in Henry II's reign.

3. Of the Household, is a similar record to (2), compiled in Edward IV's reign.

4. The term B. B. was also applied to the reports, the accusations of which are for the most part uncorroborated or exaggerated, presented to Parliament in 1536, upon which were based the laws for the dissolution of the monasteries.

Black-boy, see GRASS-TREE.

Black Bryony, see TAMUS.

Black Buck, Indian antelope, *Antelope cervicapra*. Has large ringed spiral horns. Blackish brown coat, white beneath.

Black Bulb Thermometer, maximum thermometer, of which the bulb and part of the stem are coated with lampblack, and which is enclosed in an evacuated cylinder. It thus provides a delicate instrument for the measurement of temp. by radiation only, and if placed in open sunshine and compared with the readings of an accurate thermometer in the shade, gives an indication of the difference of temp. due to direct solar radiation.

Black Cap, piece of black cloth worn over the wig by judges in Great Britain when sentence of death is to be delivered.

Black-capped Titmouse (*Penthestes atricapillus*), bird of the family Paridae, found in Europe, N. Asia, and N. America. It is known as the chickadee in N. America. It is small but strongly built, has a sharp black bill, and in colour varies between black, white, grey, and yellowish-grey. The Brit. marsh titmouse (*P.*

palustris) is sometimes called by this name.

Black Cocktail, see DEVIL'S COACH-HORSE.

Black Country, The term used to denote the mining and manufacturing dist. situated partly in the S. of Staffs, and partly in Warwickshire. It is so named from the numerous factories and coal-mines around. The manuf. of iron in all its branches is carried on, and the chief smelting centres are Wolverhampton, Dudley, Wednesbury, W. Bromwich, Walsall, Bilston, and Tipton, while Birmingham is the central market.

Black Death, name of a pestilence which was pandemic in the 14th cent. Though there were outbreaks in 1361-2 and 1369, its worst visitation was in 1348. Beginning in China—it was probably a form of the oriental plague—it reached the coast of Italy through Constantinople, and thence spread all over Europe. Its symptoms were blood-spitting, putrid pulmonary inflammation, and black spots and tumours on thighs and arms. The victim usually succumbed a few days after the appearance of the boils. The death-rate, though phenomenal, cannot be estimated, there being no scientific record of births and deaths. It is believed that 37,000,000 perished in the E., whilst in England alone something like 1,500,000, that is, between one-third and one-half of the entire pop., were mortally affected. It is said that the advent of the contagion was preceded by ominous portents—famine, drought, earthquake, dense fog, and seasonal disturbance. As in the plague at Athens, the ravages of the scourge led to outbursts of religious frenzy, but more often to demoralisation and debauchery. Mothers deserted their stricken children, and the sick were left to die and rot in public highways. The enormous mortality is a landmark in Eng. economic hist. Laws were futile to interfere with the rapid rise in wages, engendered by the scarcity of labour, whilst Wat Tyler's rebellion was only one outward indication of the far-reaching and inevitable changes that resulted in the relations between landlord and peasant.

Black Eagle, Order of the, instituted by the elector of Brandenburg on the occasion of his coronation as Frederick I of Prussia, in 1701. Its badge was a blue Maltese cross, and in the angles was a crowned B. E. It was conferred only on persons of noble birth.

Black Earth (Russian *chernozém*), rich and fertile black soil, containing a proportion of humus, found stretching in a belt across Russia from the Carpathians and the Black Sea to the Altay Mts, and in small is. further E. Its normal depth is about 1 ft., but in some places it is over 3 ft. deep.

Black Fish: 1. *Dallia pectoralis*, fish found in Alaska, characterised by the dorsal fin being far back and opposed to the anal fin—in the latter way resembling a pike to which it is allied. The scales are very small and embedded in the skin. It is a fresh-water fish, and is used for

food by the people in some parts of Alaska.

2. *Centrolophus niger*, fish of the order Stromateidae. Something like a perch, it has small cycloid scales which are deciduous. The species of this family are widely distributed, and this particular species has been found on the coasts of England. The name is also given to other varieties of dark-coloured fishes, particularly the tautog (q.v.).

Black Flux, see FLUX.

Black Forest (Ger. Schwarzwald), thickly wooded mountainous dist. of SW. Germany, in the Land of Baden-Württemberg (q.v.), running on the E. side of the valley of the Rhine (q.v.), which bounds it from Switzerland on the S. On the N. it extends to the Neckar (q.v.) valley. Its area is about 1800 sq. m., its length 100 m., greatest breadth 36 m. The S. portion is the wildest and most mountainous, containing the highest peaks: Feldberg, 4898 ft.; Herzogenhorn, 4600 ft.; Blössling, 4260 ft. The Kaiserstuhl (Emperor's Chair) is an independent group of volcanic origin, 10 m. long, 5 m. broad, the highest point being 1760 ft. The valley of the Kinzig divides the S. from the lower N. portion. The forests of the dist. consist mainly of spruce, silver fir, Scotch pine, on the higher slopes, with birches, beech, and oak below. The former large trade in logs floated down the Rhine decreased when industries were set up in the dist. dependent on the supply of wood locally for the manuf. of wood-pulp, making of toys, wooden clocks, musical instruments, etc. There are many mineral springs, those of Baden-Baden (q.v.) being the best known. The prin. tns. Freiburg and Offenburg (qq.v.), lie along the W. border. As a touring resort the B. F. has long been famous for its beautiful valleys, picturesque wooded heights, and 1st and forest lakes.

Black Friars, see DOMINIC, St.

Black Friday, 6 Dec. 1745, the day when the news that the Young Pretender had arrived at Derby was known in London. In the U.S.A. this term is (1) applied to 24 Sept. 1869. For some time during the summer of that year the balance of trade had been going against the U.S.A. and gold was being drained out of the country. The U.S. Treasury therefore discontinued the sale of gold in its possession. Two Wall Street speculators, Jay Gould and James Fiske, conceived the idea of cornering the visible gold supply in the U.S.A. They were so successful that they pushed it up to a very high price. The gov. ended their grip on things when it sent gold into the open stock market in large quantities to buy up U.S. bonds. A big stock exchange smash resulted. (2) There was another B. F. on the New York stock exchange on 19 Sept. 1873. In England, 11 May 1866, the date of suspension of payments by Overend, Gurney & Co., bankers, is also known as B. F.

Black Hand (It. *Mania*), secret society which originated in Sicily and later was active in the U.S.A. after some of its members arrived there in the late 19th

cent. They practised blackmail and extortion. For sev. years the Black Handers escaped detection owing to the fact that they chose their victims from among the poorer inhab. of the It. quarter of New York, who were too intimidated to take action. It was not until May 1914 that the police were afforded sufficient clues to effect an arrest of the B. H. gang on a large scale. Soon after this the gang was entirely dispersed. The Black Handers signed their letters of threat with the picture of a black hand clutching a dagger.

Black Hawk, Amer. Indian chief, who took part in the war of 1812 against the Americans. He was finally defeated in the Black Hawk war, 1832, after many times refusing to agree to treaties made to the effect that his tribes should relinquish their lands. After being released from Fortress Monroe, he settled in Iowa, where he d. in 1870.

Black-headed Thistle-finch, see SISKIN.

Black Hellebore, see CHRISTMAS ROSE.

Black Hills, mt system SW. of S. Dakota, and NE. of Wyoming, U.S.A. The area covered by the hills is about 6000 sq. m., and the highest point, Harney Peak, attains an altitude of 7242 ft. Large forests of pine and other coniferous trees cover their slopes. Among the minerals deposited there are gold, carboniferous limestone of good quality, and lead. The B. H. are enclosed by Belle Fourche and Cheyenne R.s. The fertility of the valleys renders dairy farming most successful.

Black Hole of Calcutta, popular name given to an atrocity perpetrated by Suraj-ud-Dowlah, nawab of Bengal. When he sacked Calcutta and seized Fort William in 1756, most of the Eng. residents escaped, but some few, under the command of Holwell, remained, and were obliged to surrender. At his command they were all confined in a guard chamber, 22 ft by 14 ft, and about 18 ft high, with only 2 small windows high up. It was a stifling summer's night, and next morning 23 alone of the 146 prisoners staggered out, or were carried out, alive. The monument commemorating the tragedy has since been removed.

Black Hundreds, name given by their opponents to the extreme right-wing elements in Russia at the beginning of the 20th cent. They stood for nationalism, absolutism, anti-Semitism, and resorted to pogroms against Jews and students. During the revolution of 1905 (q.v.) B. H. formed organisations of a Fascist type, e.g. The Union of the Russian People.

Black Isle, peninsula on the E. of Ross and Cromarty, Scotland; it lies between Cromarty Firth, N., and Beaulie and Inverness Firths, S. and SE.; on the NE. and E. it projects into Moray Firth. It has a coast-line of 52 m. The Highland railway runs from Muir of Ord to Fortrose. The prin. tns. are Cromarty and Fortrose. The soil is fertile: the highest point of the Mulbuie ridge is 838 ft.

Black-lead, Plumbago, or Graphite, mineral crystallising in the hexagonal system. It is usually found in six-sided

tabular crystals, black or dark steel-grey in colour, greasy to the touch, and with a hardness of 1. Chemically it consists of carbon with impurities of iron sesquioxide and clay. It resists chemical change more than other forms of carbon, fusing only in the electric arc, and is unaltered by most acids. It is a good conductor of electricity, and is so soft that it marks anything it touches; hence its use for the manuf. of writing pencils and as a polish for ironwork. Its greasy nature makes it an excellent dry lubricant for the breech-locks of rifles, etc., where a volatile lubricant is not desirable. Graphite is found in beds and embedded masses, scales, or leaflets in granite, gneiss, mica schist, and crystalline limestone. It occurs amongst slate in Cumberland and gneiss in Scotland; quantities are exported from Ceylon, and that found at Irkutsk in E. Siberia is probably the best in the world. America is supplied by beds at Ticonderoga in N. Carolina, and at Sonora, Mexico. It is artificially produced in iron furnaces and is produced electrically from anthracite for the manuf. of black-lead pencils.

Black Letter, name given to type used in the earliest printed books, sometimes as equivalent term to 'Gothic,' sometimes confined to the early Eng. types used by Caxton, also styled 'English type.' The words following are printed in Black letter, which is used in ornamental printing. Early types were copied, from the handwriting in use at the time, and thus the Ger. script was adopted. Gothic or B. L. was used extensively all over Europe in various forms and modifications. It was succeeded by the It. or Rom. type, founded on the purer and simpler It. or Rom. script of the 12th cent., but it long remained in use for printing Bibles, law-books, proclamations, and the like. B. L., or rather a modification, was the national Ger. type for printing, but since the Second World War it has given place to the roman type (or 'white letter,' as it was called). In old church calendars the greater festivals and saints' days were marked by being printed in red ('red-letter days'), the lesser days were printed in black ('black-letter days'), hence the term came to be applied to unlucky, inauspicious days.

Black List: 1. The name given to a printed list issued to subscribers by various trade protection societies, which shows the names of those whose credit is bad, thus serving as a warning against allowing them to incur fresh debts. Such lists are made up from judicial and other sources, and include the records of bankruptcies, arrangements or compositions with creditors, unsatisfied judgments for debts, bills of sale, liquidations, warrants of attorney, dissolution of partnership, and all matters of public record that affect the financial standing of the parties named in the list.

2. The list of individuals or firms who shall not be supplied or dealt with by members of a trade association in order to enforce prices or other conditions of trading. B. L.'s were used to enforce

resale price maintenance before the 1956 Restrictive Trade Practices Act.

Black Mountain, collective name of a group of hills lying to the W. of the Brecon Beacons on the border of Breconshire and Carmarthenshire, of which the highest is Carmarthen Van (Fan Foel), 2632 ft.

Black Mountains: 1. Group of mts W. of N. Carolina, U.S.A. Most of the area is situated in Yancey and Buncombe cos. They are the highest mts (6684 ft) of the Appalachian system.

2. A fine range of hills on the borders of Breconshire, Herefordshire, and Monmouthshire, of which the highest is Waun Fach (2660 ft).

3. See SCHWARZGEBIRGE.

Black Prince, The (1330-76), name given to Edward, Prince of Wales, eldest son of Edward III. He was b. Woodstock; made Earl of Chester, 1333. Duke of Cornwall, 1337, created Prince of Wales 1343. His military career began with the Fr. campaign of 1346, and he distinguished himself at Crécy and at the siege of Calais. He was one of the original knights of the Garter and was present at the naval battle off Winchelsea with the Spaniards in 1350. In 1355, as lieutenant for his father in Gascony, he reconquered much ter., and made many marauding expeditions, and in 1356 won the victory of Poitiers, showing himself a master of tactics, and returning in triumph to London with King John his prisoner. He took part in the expedition to France in 1359 which ended in the peace of Calais, 1360. In 1361 he married Joan, Countess of Kent, his cousin, and in 1362 was made Duke of Aquitaine, where he ruled as a vassal sovereign. In 1367 he lent his aid to Pedro the Cruel, deposed King of Castile, led his army into Spain, and defeated the usurper Henry of Trastamare and Bertrand du Guesclin at Najera. The expedition ruined him in health and resources, and his own vassal barons rose in rebellion against him. His dominions shrank, and after the cruel and indiscriminate sack of Limoges, 1370, he returned to England, resigning his dukedom in 1372. He was buried in Canterbury Cathedral in the great tomb with his arms above it. His name of Black Prince cannot be traced earlier than the 16th cent.; tradition makes it due to his black armour. His contemporary reputation for chivalry cannot be sustained after c. 1360 but he had great qualities as a military leader. See R. P. Dunn-Pattison, *The Black Prince*, 1910.

'Black Prince,' the second Eng. iron-clad (9210 tons, 13.6 knots, 40 guns, heaviest 68-pounders), was launched in 1861. Another B. P., armoured cruiser (13,550 tons, 22.3 knots), was launched in 1904 by the Thames Shipbuilding Co., and was sunk in the battle of Jutland (q.v.). The first B. P. in the Eng. Navy served under Prince Rupert, and was driven ashore by Blake.

Black River, riv. of New York, U.S.A. It forms the boundary between the cos. of Hamilton and Herkimer, and empties itself in Lake Ontario. Its length is 130 m.

Black Rod, official of the Brit. House of Lords, the full style being the 'Gentleman Usher of the Black Rod.' The name is derived from his staff, the insignia of his office, an ebony rod topped with a golden lion. The office dates from Henry VIII. B. R. is also the first usher of the court and the kingdom, and as such takes part in all court and other ceremonials; he is also the prin. usher of the order of the Garter, and as such his duties include the guarding of the door at a chapter of the knights. His duties as an official of the House of Lords are the most important; they correspond to those of the sercant at arms in the House of Commons. He maintains order and has the power to arrest a peer for breach of privilege of the House or other offences noticed by the House. He is the official messenger from that House to the House of Commons. These duties are performed personally or by his deputy, the 'Yeoman Usher of the Black Rod.' Certain formalities and ceremonies are observed, interesting as dating from the attempt of Charles I to arrest the 5 members in 1642 and as signifying the right of the Lower House to freedom of debate and security from interruption. When the House of Commons is summoned to the House of Lords to hear the queen's speech from the throne or to attend at the giving of the royal assent to bills, B. R. has to summon their attendance; at his approach the doors are closed upon him: he knocks thrice, and announces his presence. On his admittance he addresses the Speaker, and if the queen is present in person, the message is that 'the queen commands the presence of the honourable House'; if she is represented by commissioners, then the word used is 'desires.' The office of B. R. is held by a distinguished service officer; the salary is £1700 a year. See HOUSE OF LORDS.

Black Scab, wart disease in potatoes, is due to a fungus, *Synchytrium endobioticum*. It causes excrescences which become black. It is avoided by growing immune varieties, of which there are many. An outbreak of B. S. must be notified to the Ministry of Agriculture.

Black Sea, or **Euxine** (anc. Pontus Euxinus, Turkish *Kara Dengiz*), inland sea situated between E. Europe and Asia Minor, bounded on the N. and E. by Russia, on the W. by Rumania, Bulgaria, and Turkey, on the S. by Turkey. Its greatest length is about 720 m., and the greatest breadth 380 m. The total area is about 170,000 sq. m. By the strait of Kerch it communicates with the sea of Azov on the N., and by the Bosphorus, sea of Marmora, and the Dardanelles with the Mediterranean. On the NE., E., and SW. the coast is high, and flat on the N. and NW. Its maximum depth reaches the prodigious figure of over 7000 ft, the 100-fathom line running close to the shores, except on the E. and W. of the Crimean peninsula. The salinity of the water is on the average only half that of the ocean, a fact due to the enormous body of fresh water poured in by the large rivers, such as the Danube, Dniester, Bug,

Dnieper, Kuban, Rion, Kizil-Irmak, and Sakaria. There is a strong surface-flow out through the Bosphorus, and a deeper inward flow from the same direction. The strong currents, sudden and frequent storms, fogs, and occasional drift-ice sometimes render navigation difficult in winter. There is no perceptible tide. The deeper waters are apparently devoid of organic life, the higher forms not being known to exist below 100 fathoms. There are no is. of importance. The chief ports on the sea are Odessa, Nikolayev, Novorossiysk, Batumi, and Poti in Russia, Constanta in Rumania, Varna and Burgas in Bulgaria, and Trebizond in Turkey. By the treaty of Paris (1856) the sea was closed to all ships of war. This provision, however, was abrogated in 1871, and Russia and Turkey both have fleets in its waters. The question of naval forces in the B. S. naturally formed part of the discussions at the conclusion of the First World War, for whatever conditions were laid down by the victors as to the status of the Dardanelles and the Bosphorus *ipso facto* included the B. S. In the armistice signed at Mudros (30 Oct. 1918), one of the chief conditions was that the straits should be open to the allied fleets. Thus Great Britain made a complete reversal of her former policy, which for a century had aimed at closing the straits to all nations' warships except Turkish. The result of this change was that the Brit. Navy secured the legal right to enter the B. S. when it intervened in the struggle between the Russian Whites and Reds in 1919 and 1920. At the same time the policy of the present rulers of Russia is a reversal of that of the old Russian Empire, and the U.S.S.R. now seeks to keep the B. S. open to only the warships of those powers with ter. on its littoral. For military operations at the B. S. ports in the Second World War see EASTERN FRONT OF RUSSO-GERMAN CAMPAIGNS IN SECOND WORLD WAR.

Black Shirts, see FASCISM.

Black Snake (*Coluber constrictor*), ophidian reptile of the family Colubridae. The name was given to it long ago by Mark Catesby (q.v.). It is a slender snake, harmless and non-poisonous. The male is smaller than the female; the largest specimen does not exceed 6 ft in length. The colour is usually a dark shining black above, slate-grey beneath, with white markings, and a black tongue, but some of these animals are pale green and yellow, and are called green racers. The snake can swim, move swiftly on the ground, and climb lofty trees. Its food consists of frogs, toads, mice, smaller snakes, insects, birds, and eggs. It inhabits both N. and S. America.

Black Thursday, 6 Feb. 1851, the date of a bush fire of unprecedented magnitude in Victoria, Australia, causing enormous damage and loss of farming stock.

Black Varnish, *Melanorrhoea usiata*, large tree of the cashew nut family (Anacardiaceae). Native of Burma and Malaya and said to reach a height of 80-100 ft. Large spreading head, broad leathery leaves; its wood is hard, black,

and heavy. It has a white sap, that is tapped, and becomes black on exposure to the air, and is used for lacquering. Also called Pegu lignum.

Black Watch, The (Royal Highland Regiment), name of the first of the Highland regiments, so called because its uniform was a dark tartan, whilst the regular soldiers wore red. The regiment was formed from independent companies of Highlanders for service in Scotland in the 17th cent., and later became the 42nd Foot. In the year of its creation, John, 2nd Earl of Atholl, was granted a commission to raise a body of men to keep the peace in the Highlands. Three companies only existed from 1704 to the Union, these being under the direct control of the Treasury as regards pay, uniform, and fire-arms. But in 1729 the number was raised to 6, 3 of 100 men each, and the remaining of 70. Drawn chiefly from the Whig clans of the Campbells, Munros, etc., the B. W. enforced the Disarming Act under George II, and effectually helped to prevent any further national risings. In 1743 this regiment, now enrolled as the 42nd, served in Flanders, fighting at Fontenoy, etc., and later served for many years in Canada, W. Indies, and during the Amer. War of Independence. Under Wellington it served throughout the Peninsular war and at Waterloo. The Crimea, Indian Mutiny, and 1882 Egyptian campaigns are also among its honours. In 1756 its 2nd Batt. became the 73rd Foot, whose early service was in India. It was at Waterloo, after which it served in the E. Indies, Mediterranean, Canada, Cape Colony, S. America, and Indian Mutiny. In 1881 the 42nd and 73rd were again united to form the B. W., which served with distinction in the S. African war, 1899-1902. A monument erected by the officers in Dunkeld Cathedral commemorates all who had died in battle up to the settlement of the Indian Mutiny in 1859. During the First World War 25 of its battalions served overseas in France, Flanders, Macedonia, Palestine, and Mesopotamia. In the Second World War the B. W. fought in France and the Low Countries, in Italy, and in the Far East. They were among the *elite* Brit. troops pitted against the best Ger. troops in the great battles of the winter of 1944-1945 for the Rhenish plain N. of Cologne. As part of the 51st (Highland) Div. of the Eighth Army (q.v.), they fought in N. Africa and Sicily, and were in the very hard fighting around Corradini and Homs in Sicily later in the summer of 1943. Earlier, they took part in the fierce fighting in the battle of Akarat. In Burma other units formed part of the famous Chindit force of Maj.-Gen. Wingate.

Blackberry, *Rubus*, sub-genus of Rosaceae which has sev. species in Britain. The plant is a hook-climber, and frequently roots where the branches touch the earth, thus forming a new plant. The fruit grows on a flattened thalamus with a conical protuberance on which are borne many one-seeded drupelets; it therefore consists of an aetacior of drupes,



BLACKBERRY

and is not properly a berry. It is also commonly called bramble. See also DEWBERRY.

Blackbird (*Turdus merula*), name of a common bird, found all over Europe, in Asia, and N. Africa. It has been acclimatised in New Zealand. In Great Britain it is a resident, but large numbers of emigrants also come in the autumn. The male is entirely black, with bright yellow beak, taking a deeper and more vivid colour in the breeding season. The female is of a dusky brown, fading to a paler hue beneath. The nest, built in thickets or creeper-clad trees, is of grass and moss, and plastered with mud; the eggs, 4 to 6 in number, are blue with brown specks. The B. is a fine song-bird, its notes being clear and loud, but it has not the range or modulations of the thrush. Destructive to fruit and seeds, it also feeds largely on worms, grubs, snails, and is useful in keeping down garden pests. Its O.E. name 'ousel,' appears in the name of a variant, the ring-ousel, so called from its white neck marks. It is a large moorland B., a migrant from Africa. See RING OUZEL.

Blackbirds, Field of (the Kosovo Polje), plain in Serbia, Yugoslavia. It is in the region of Kosovo-Metohija (q.v.), and was the scene of 2 great battles: (1) the Turkish victory of 1389 (see SERBIA, History); (2) the defeat of Janos Hunyadi (q.v.) by the Turks in 1448.

Blackburn, Colin, Baron (1813-98), judge, b. Selkirk. In 1838 he was called to the Bar, and he became a judge in the court of queen's bench in 1859. In 1876 he was made a life peer and a lord of appeal. His *Contract of Sales* was pub. in 1845.

Blackburn, municipal co., and parl. bor. of Lancs, England, 24 $\frac{1}{2}$ m. NNW. of Manchester, 9 m. E. of Preston. It lies on the brink of the Ribbles Valley, and on the first eminence between the W. coast and the Pennines, the surrounding hills being 700 to 900 ft high. B. is the prin.

cotton-weaving centre of Lancs, and, despite the general downward trend of the industry during the last 25 years, it still maintains an important position in the textile world. It is true that whilst cotton weaving was formerly the staple trade of B. the number of cotton mills now operative represents only one-half of the number in 1920; but many persons redundant to the cotton trade have found employment in the manuf. of slippers, electrical and wireless components, fancy leather goods, and in dye-works, and the making up of cotton garments. The manuf. of textile machinery and utensils, and other types of engineering still are an important part of the industrial activity of the tn. There are good rail and road facilities to all parts. James Hargreaves, the inventor of the spinning jenny, was b. at Stand Hill on the outskirts of B., and his employer, Robert Peel, grandfather of the Prime Minister, Sir Robert Peel, greatly fostered the growth of the cotton industry. Viscount Morley was another famous native of B. The tn was incorporated in 1851, and made a co. bor. in 1888. There are fine parks, the prin. being Queen's Park, Corporation Park, and Roo Lee Park. St Mary's Church, a very anct foundation, although the present building dates only from 1826, forms the nave of the cathedral of the B. diocese, which was created in 1927, and is a fine representative of modern Gothic. Among other notable public buildings are the fine public halls in Northgate, the new sessions house and police courts adjoining, and the public library, all in close proximity to the tn hall, a noble building in the It. Renaissance style. Historical places near by are Hoghton Tower, Clitheroe Castle, Whalley Abbey, and Stonyhurst College at Hurst Green. It is divided into 2 parl. constituencies, B. E. and B. W., each returning 1 member. Pop. 111,220.

Blackburne, Francis (1782-1867), lord chancellor of Ireland, b. co. Meath; educ. at Trinity College, Dublin; called to the Eng. Bar, 1805, and to the Irish Bar, 1822, when he was employed in repressing disorder in Limerick under the Insurrection Act. He was attorney-general for Ireland, 1830 and 1841; master of the rolls, 1842; chief justice of the queen's bench, 1846 (in this capacity he presided at the trial of Wm Smith O'Brien, q.v.); and lord chancellor, 1852; in 1856 he was made a lord justice of appeal. In 1866 he again became lord chancellor.

Blackburne, Lancelot (1658-1743), Eng. prelate. He was educ. at Westminster School, afterwards entering Christ Church, Oxford, in 1676. His rise in the church was due originally to Bishop Trelawney. He became Bishop of Exeter in 1717, and Archbishop of York in 1724. His disposition was gay, and he seems to have been noted as a wit. A certain freedom from the restraint usually observed by the clergy caused many fables to be circulated regarding his 'licentiousness.'

Blackburn's Pendulum, see PENDULUM.

Blackcap (*Sylvia atricapilla*), bird of

the family Sylviidae or Warblers. The general colour of the bird is an ashen-grey, turning to an olive-brown above and pale or whitish-grey below. The cock bird alone has the jet-black cap which gives the name, the hen's head-covering being brown. It is one of the sweetest of song-birds. It leaves Great Britain at the end of summer.

Blackcock and **Heathcock**, names applied to both sexes of the black grouse, *Lyrurus tetrix*, though greyhen is a more suitable designation of the female. They are allied to the quail, partridge, and capercaillie, and are common in N. Scotland. The food consists of buds, young shoots, berries, and insects. The plumage of the male is very beautiful, the tail is lyrate, and above the eyes is a piece of bright red skin which becomes more intense during the pairing season. The bird is polygamous, and in the spring the males attract the females by curious crowings and noises as of the whetting of a scythe.



E.N.A.

A YOUNG BLACKFOOT INDIAN

Blackfoot, Eng. name given to a tribe properly called Siksika—they were so called because their moccasins were stained or dyed black. They are of Algonquian stock, and were one of the largest and fiercest tribes of the plains. They suffered severely from smallpox, and from an estimated 15,000 in 1780 they have dwindled to about 6000 in Montana and Saskatchewan.

Blackfriars Bridge, bridge over the Thames, London, crossing the riv. approximately at the point where the R. Fleet once debouched into the Thames. The first B. B. was begun in 1760, completed in 1770, and removed in 1860. The present was begun in 1865, and opened in 1869, from designs by J. Cubitt. It was widened for the London County Council electric tramway along the Embankment to Westminster Bridge in 1907-9. The name commemorates the monastery of the Blackfriars or Dominicans on the N. side of the Thames at this point.

Blackfriars Theatre, see THEATRE.

Blackheath, common and residential dist. in SE. London, the former lying mostly in the bor. of Lewisham. Once extending about 4 miles between Lewisham and Woolwich, it is now only about 70 ac. owing to building encroachments. Greenwich Park, on its N., once formed part of it. The heath, lying across the main Dover road, was the scene of the rebellious gatherings under Wat Tyler (1381) and Jack Cade (1450). Lord Audley's Cornish rebellion of 1497 against Henry VII was suppressed here, and here the people met Henry V after Agincourt and Charles II at the Restoration. It was also the resort of highwaymen. Golf was probably played on B. earlier than elsewhere in England, and the Royal B. Golf Club, founded 1608, is the oldest golf club. Rectory Field on B. is the ground of the B. Rugby Football Club and a ground of the Kent County Cricket Club. On the SE. is Morden College, founded by Sir John Morden in 1695 as a pensionary for Turkey merchants. The pleasant residential area of B. at the SE. is in the bor. of Greenwich.

Blackie, John (1782-1874), publisher, b. Glasgow, Scotland. At 12 years of age he was apprenticed to a weaver in Glasgow and later worked for John Duncan, whose daughter he married. He left weaving in 1805 to work for W. D. & A. Brownlie, publishers, and, on the retiral of the Brownlies in 1807, acquired their business; this subsequently, 1809, became the firm which still flourishes under the name of Blackie & Son Ltd.

Blackie, John Stuart (1809-95), Scottish writer and scholar, b. Glasgow. He was educ. at Marischal College, Aberdeen, Edinburgh Univ. (1825-6), and in Germany. He was prof. first at Aberdeen, and then at Edinburgh Univ., a chair he held till 1882. He took a prominent part in educational reform and the remodelling of Scottish univs. His literary output was great, and he was also instrumental in the founding of a professorship of Celtic at Edinburgh Univ. The grievances of the Highland crofters, and all questions of Scottish nationality and customs, drew his enthusiastic support. See A. M. Stoddart, *J. S. Blackie*, 1895.

Blacking, mixture applied to leather, especially that of boots and shoes, in order to produce a polished surface. It is made from various fats, using nitrobenzene to cover any odour, in conjunction with a suitable colouring material such as lampblack.

Blacking Plants (*Hibiscus rosa sinensis*), shrub of about 6-8 ft, family Malvaceae, native of China; a showy plant in hot-houses, having single or double red and yellow flowers. The red, when bruised, turn black, and are used for colouring eyebrows and blacking shoes.

Blackley, residential dist. of Manchester (q.v.).

Blacklock, Thomas (1721-81), Scottish poet, b. Annan, Dumfriesshire, son of a bricklayer. He lost his sight through smallpox when 6 months old. Some early poems pub. in 1746 led to his education at Edinburgh, where he studied divinity. He was an early admirer and friend of Burns, and persuaded him to abandon his leaving Scotland for the W. Indies. He supported himself by taking pupils in Edinburgh. See H. Mackenzie's ed. of poems with life, 1793.

Blackmail once referred to rent paid in labour, corn, or baser metal (*reditus nigri*) so called to distinguish it from silver money (*maillies blanches*). It is now applied to unlawful extortion of money by menaces. In Eng. law it is loosely used to refer to certain offences under the Larceny Act, 1916. These may be broadly defined as: (a) to threaten to accuse a person (living or dead) of certain specified crimes with intent to extort any property; (b) to demand money or property with menaces; (c) to publish or propose to refrain from publishing, any matter about a person (living or dead) with intent to extort property or an office of profit or trust.

Blackmore, Sir Richard (c. 1650-1729), physician and author, b. Corsham, Wilts. He was first a schoolmaster, then studied medicine and practised in London. Supporting the revolution he was knighted 1697, and became court physician to William III and to Queen Anne. He was a writer of dull and turgid epics, which merit the ridicule of Pope's *Dunciad*, though they were praised by Addison; and one, *Creation*, 1712, expounding Locke's philosophy as against the infidelity of Hobbes, was thought worthy by Johnson of appearing in the booksellers' collection of the Brit. poets to which Johnson supplied the lives.

Blackmore, Richard Doddridge (1825-1900), novelist, b. Longworth, Berks. Educ. at Bundell's School and Exeter College, Oxford, he was called to the Bar and practised till he had a breakdown in health. He then combined literary work and market-gardening at Teddington. His poems were not successful, but his first novel, *Clara Vaughan*, 1864, was at once welcomed. In 1869 was pub. his best work, *Lorna Doone*, a romantic story set in the scenery of Exmoor, which gained the author a lasting popularity. His other novels include *Cradock Nowell*, 1866, *The Maid of Sker*, 1872, *Cripps the Carrier*, 1876, *Christowell*, 1880, *Springhaven*, 1887, *Perlycross*, 1894, *Tales from the Telling House*, 1896, and *Daniel*, 1897. See life by W. H. Dunn, 1956.

Blackmur, Richard Palmer (1904-). Amer. poet and critic, b. Springfield, Massachusetts. From 1936 to 1938 he

held a Guggenheim fellowship, and in 1940 he joined the staff of Princeton, where he became prof. of English in 1951. He pub. three vols. of poems: *From Jordan's Delight*, 1937, *Second World*, 1942, and *The Good European*, 1947. His critical works include a collection of essays, *The Epanse of Greatness*, 1940, *Henry James* (a study), 1941, *Language as Gesture*, 1952, and *The Lion and the Honeycomb*, 1955.

Blackpool, municipal, co., and parl. bor. of Lancs, England, situated on the W. coast, 46 m. N. of Liverpool and 8 m. SW. of Fleetwood, on the Irish Sea, between the mouth of the Ribble and Morecambe Bay. It is one of the most popular holiday resorts in the world—catering for 7,000,000 visitors in the course of a season. Its magnificent promenade stretches for 7 m. along the coast, and contains sunken gardens, waterways, colonnades, sun-lounges, and cliff walks, whilst the whole length is fringed by sands, free from shingle, and practically a mile in width at low water. The gradually sloping beach makes for safe sea-bathing. The tn is dotted with many tennis courts, bowling and putting greens, and, in the largest of the parks—Stanley Park—there are 32 tennis courts, 6 bowling greens, 2 putting greens, a golf course, and a 26-ac. boating lake. The tn's indoor entertainments include a permanent circus, 4 theatres, an ice drome, 18 cinemas, 7 ballrooms, the one in the Winter Gardens being the largest in Europe, and home of the International Dance Festival. The Tower, B.'s landmark, 520 ft high, houses a menagerie, aquarium, aviary, roof-gardens, ballroom, etc. The Derby Baths, which were completed in 1939 (accommodation for 5000 spectators and 3000 bathers), and the open-air swimming pool at South Shore are amongst the finest in the world. There are over 5000 hotels, private hotels, and boarding and apartment houses. B., which owes its name to a peaty-coloured pool, now covered in, at the S. side of the tn, was made a parl. bor. in 1918, including the bor. of Lytham St Anne's. The same year the urban dist. of Bispham with Norbock and part of Carleton were incorporated in it. The Princess Parade was opened by H.R.H. Princess Louise in 1912, and the Opera House rebuilt the same year and again in 1939. B. returns 2 members to Parliament. Pop. 146,300.

Blackrock: 1. Seaside suburb of Dublin (5 m.). Rep. of Ireland. Pop. 9000.

2. Suburb of Cork (q.v.).

3. Vil. of co. Louth, Rep. of Ireland, on Dundalk Bay. Pop. 900.

Blackrod Bay, bay in Mayo co., Rep. of Ireland, N. of Achill Is., some 10 m. in extent, and a safe anchorage.

Blackstone, Sir William (1723–80), jurist, b London, educ. at Charterhouse and Pembroke College, Oxford. He entered the Middle Temple, 1741, and was made fellow of All Souls, 1744. In 1749 he became recorder of Wallingford. In 1753 he abandoned his legal practice and returned to Oxford to college duties. In

1758 he became the first Vinerian prof. of law. The success of his lectures led to a pirated ed., and in 1765 he pub. the first vol. of the *Commentaries on the Laws of England*. The 4 vols. were completed and pub. in 1769. The reputation which he thus made drew him back to practice and public life. He was Member of Parliament for Hindon, and later for Westbury, and in 1770 was made a judge of the court of common pleas. B. made no mark as a judge, nor are his miscellaneous writings of value; his fame rests upon his *Commentaries* alone. This work became the indispensable text-book for lawyers for nearly a century, and was also a model on which the body of Eng. law was built up in America and the Brit. colonies. Written in a readable style, it gave the first clear picture of Eng. law as a whole. It has permeated the whole idea of law for the ordinary man, and for long was treated with as much respect as if its text contained a final legal decision to which all must bow. Historians and jurists have broken the false position in which it was placed, but it must be remembered that the author aimed only at what he succeeded in achieving, an admirable and lucid exposition of the great body of law, which till the appearance of the *Commentaries* was a closed book to all but the highly trained expert.

Blackstonia, family Gentianeaceae, genus of annuals, of which *B. perfoliata* (synonym *Chlora perfoliata*), Yellow-wort, grows on calcareous soils in Britain and Europe. Four other species are found in Europe and Mediterranean region.



BLACKTHORN

Blackthorn (*Prunus spinosa*), family Rosaceae; common shrub in hedgerows and thickets, marked by its black stems, hard sharp spines or thorns, and the pure white blossoms which appear before the leaves in Mar. and April. The fruit, generally known as sloes, is a small bluish-black drupe of a sour flavour. The hardness of the wood of the B. and the fact that its black bark takes a fine polish.

makes it a favourite walking-stick; in Ireland it was used for making 'shillelaghs' or cudgels. *P. domestica*, the plum, is held to be a hybrid of *P. spinosa* × *P. cerasifera*.

Blackwall, Anthony (1674–1730), Eng. scholar, graduated at Emmanuel College, Cambridge, and was early appointed headmaster of the Derby School. From 1722 to 1730, with the exception of the years 1726–9, when he was rector of Clapham, Surrey, he was headmaster at Market Bosworth Grammar School, Leics. His most famous work, *The Sacred Classics*, 1725, in which he demonstrated the purity of the Gk Testament, appeared in 1725.

Blackwall, riverside dist. in the bor. of Poplar, E. London, containing the E. India Docks and the Thames Iron Works. It has been a shipbuilding centre from early Stuart times, and many vessels have been built there for the Royal Navy. B. Tunnel, constructed 1892–7 at a cost of nearly £1,500,000, connects with N. Greenwich.

Blackwater: 1. Riv. of Essex, England, rising near Saffron Walden. After a S.-easterly course, it flows with the Chelmer into the N. Sea.

2. Riv. of N. Ireland, rising in the S.E. of Tyrone, and falling into Lough Neagh at the SW. corner. It is the boundary between Tyrone and Armagh.

3. Riv. in SW. Ireland, rising in Co. Kerry and forming the boundary between Kerry and Cork till it flows E. through Cork and Waterford. At Cappoquin it becomes navigable and turns S. to reach the sea at Youghal (Cork), after a course of 106 m. It is celebrated for its salmon fishing.

Blackwater Fever, condition associated with malaria (q.v.) and perhaps related to the administration of quinine. The immediate cause of an attack of B. F. is still not known, although its relationship to recurrent attacks of falciparum malaria and quinine administration is certain. B. F. is essentially a disintegration of the red blood corpuscles within the blood vessels, resulting in the liberation of haemoglobin and the passing of haemoglobin in the urine (i.e., blackwater). The onset is abrupt with headache, vomiting, severe backache, and prostration. The urine is dark red or almost black. The patient is restless and anxious, with difficulty of breathing. Jaundice appears a few hours after the onset of the attack. The spleen and liver are enlarged and tender. Suppression of urine may occur, with uraemia (q.v.), heart failure, and early death. Patients who survive the early stages remain in a precarious condition from extreme anaemia and heart weakness. Treatment consists in absolute rest and nursing. If malarial parasites are seen in the blood antimalarial drugs are given, but quinine and pamaquin must be avoided. Intravenous transfusions of glucose, saline, and plasma are usually called for.

Blackwell, Benjamin Harris (1814–1855), Brit. bookseller, commenced book-selling in Oxford in 1846, but d. when his

eldest son Benjamin Henry B. was 6 years old. So the business came to an end. It was refounded by Benjamin Henry B. on its present site in 1879. In 1912 his son Basil Henry B. joined the firm and developed its publishing business with the imprints of Basil Blackwell and of the Shakespeare Head Press. In 1919 the firm took the title of B. H. Blackwell Ltd, Booksellers. In 1921 the firm of Basil Blackwell & Mott Ltd, Publishers, was founded at the same address.

Blackwell, Elizabeth (1821–1910), physician, b. Bristol, England. Her parents settled in Cincinnati, where, her father dying prematurely, she had to assist her mother to support a large family by running a boarding school. Decided to become a physician, and, in 1849, graduated with the highest honours at the Geneva Medical College, New York, being the first woman to obtain a medical degree in the U.S.A. Later, with a sister, she studied in Paris, and in spite of the prevailing prejudice and opposition to women practitioners, she started, in 1853, the Infirmary for Women and Children in New York, the first of its kind. Fifteen years later the sisters founded the Women's Medical College of New York Infirmary, afterwards affiliated to the Cornell Medical College. The following year she settled in London, where she took part in founding the National Health Society of London, and the London School of Medicine for Women. Lectured on medical and educational topics, and wrote *The Physical Education of Girls*, 1852, *Moral Education of the Young*, 1879, *The Human Element in Sex*, 1884, *The Influence of Women in Medicine*, 1889, and *Pioneer Work in Opening the Medical Profession to Women*, 1895. See E. M. Bell, *Storming the Citadel*, 1953.

Blackwell, George (c. 1545–1613), priest, b. probably in London. He graduated at Trinity College, Oxford, but his Catholic convictions forced him to go to Douai, 1574, and he was ordained priest in 1576. He joined the Eng. mission, 1576, suffered imprisonment for a short time, and thereafter lived in hiding. In 1598 he was made archpriest over the secular clergy of England and Scotland, but was unpopular among many of his fellow Catholics because of his arbitrary manner. In 1608 B. was deprived of his office for subscribing to the oath of civil loyalty imposed on Catholics in 1606, which had been condemned by the Pope.

Blackwell, Thomas (1701–57), classical scholar, b. Aberdeen; educ. at a grammar school there, and at Marischal College, Aberdeen Univ. He took his M.A. in 1718, and was elected to the professorship of Greek at Marischal College in 1723. In 1748 he was made prin. of the college, a post which he held till his death, being the only layman to hold the post since it was under crown patronage. He became doctor of laws in 1752, and d. at Edinburgh.

Blackwood, Algernon Henry (1869–1951), novelist, b. Kent, son of Sir Arthur B. and the former Duchess of Manchester.

Educ. at Wellington and Edinburgh Univ., at the age of 20 he went to Canada and worked at a great variety of jobs; in *Episodes before Thirty*, 1923, he tells of his early roving life. Greatly interested in the occult, he has been called 'the ghost man' because of his subjects. His novels include *John Silence*, 1908, *The Human Chord*, 1910, *The Wave*, 1916, and *Dudley and Gilderooy*, 1929. *Incredible Adventures*, 1914, *Tongues of Fire*, 1924, and *Tales of the Uncanny and Supernatural*, 1949, are vols. of short stories. In 1949 he was made a C.B.E.

Blackwood, Admiral Sir Henry (1770-1832), naval officer, the son of an Irish baronet. Entering the navy in 1781, he became captain, 1795; rear-admiral, 1814; vice-admiral, 1821. He was warmly congratulated by Nelson for his conduct in a sea fight between the *Penelope*, which B. was commanding, and the *Guillaume Tell* in 1800. He was with Nelson at Cadiz, and afterwards served under Lord Collingwood. In 1807 he narrowly escaped drowning at the entrance to the Dardanelles, where his ship was destroyed by fire. He was present at the blockade of Toulon, and in 1819 he was made K.C.B., and commander-in-chief in the E. Indies. He was commander-in-chief at the Nile from 1827 to 1830.

Blackwood, William (1776-1834), publisher, b. Edinburgh. B. served his apprenticeship to the bookselling business in Edinburgh, and afterwards worked in Glasgow and London before settling in Edinburgh in 1804 as a bookseller, dealing principally in old books. In 1810 he set up as a publisher, and in April 1817 the first number of *Blackwood's Magazine*, still in existence as a monthly of high standard, was issued.

Blackwood, timber of various Indian leguminous trees, common on the Coromandel and Malabar coasts. The chief species are the Indian papilionaceous tree, *Dalbergia latifolia*, the wood of which is used for making furniture; *Melbania melanocylon* of New S. Wales; and the *Acacia melanocylon*.

Bladder, Urinary, hollow organ situated in the front part of the pelvic cavity. Its wall is composed of muscular tissue, and the urine from the kidneys is conveyed to it by 2 *ureters* which open into the posterior part of the B. (see KIDNEY). The fluid is expelled through the *urethra*, the opening of which lies at the bottom of the B., and is normally closed by a sphincter muscle. The epithelial lining of the B. is ridged and convoluted in a series of trabeculae. The shape when empty is approximately that of a tetrahedron, but it becomes rounded when distended. The function of the B. is to serve as a reservoir for the urinary fluid from the kidneys before it is ejected from the body. Micturition, or the passing of urine, is an automatic reflex action in infants. Distension of the B. causes impulses to travel along the afferent nerve paths to the lumbar region of the spinal cord. Here the afferent impulses are transferred to the efferent motor nerve paths which supply the urethral sphincter muscle, causing it to

relax and thus allow the fluid to escape from the B. As from about the age of 2 years, the child learns to exert conscious control over micturition, and impulses from the cerebrum inhibit the reflex mechanism, which now comes into action only, as it were, with cerebral permission. This cerebral control of micturition gradually becomes so estab. that it can be maintained even in sleep. Sometimes, however, nocturnal control is not estab., or it may be estab. but breaks down, and the condition known as *enuresis*, or bed-wetting, occurs. *Enuresis* is not a disease: it is merely a symptom of failure of cerebral control. Only very rarely is there any local pathological lesion of the genito-urinary organs to account for it. It is often hereditary. Most enuretic children develop the necessary control as they get older. In a few cases, however, the condition persists into adolescence and adult life and may be a considerable handicap. In a number of cases, and particularly in those in which control has been estab., but has broken down again, there is a psychological cause for the trouble. If this can be ascertained and eradicated dramatic improvement often occurs. A child who wets the bed should never be scolded or punished for something over which it has no control. Rather should praise be given on those occasions on which the bed is dry. However pessimistic the mother may feel, she must maintain an air of cheerful optimism in front of the child, adopting an attitude of 'together we will get the better of this.'

Diseases. Since the B. is one part of the whole genito-urinary tract, infections from other parts are liable to spread to it, and vice versa. *Cystitis*, or inflammation of the B., may be caused by any organism. Infection from the *Bacillus coli* may arise from a pyelitis (q.v.) due to that organism. Tuberculous cystitis is also associated with tuberculous pyelitis. Gonorrhoeal cystitis also occurs from gonorrhoea (q.v.). The symptoms of cystitis are pain in the lower abdomen, frequency and pain on micturition. The urine is offensive and cloudy. The treatment consists in treating the cause. Plenty of bland fluids should be taken and alcohol avoided. Chronic cystitis may occur in association with any condition in which emptying of the B. is incomplete and in which, in consequence, there is a constant retention of a pool of stagnant urine. The condition occurs most often in old people, particularly in men with an enlarged prostate gland (q.v.), or it may be associated with a stone in the B. Stricture (q.v.) is another cause of chronic cystitis. The symptoms of chronic cystitis are similar to those of the acute form, but not so severe. Incontinence of urine may occur in any disease of the nervous system in which the neuro-muscular control of the B. sphincter is interfered with. *Fesical calculus*, or stone in the B., is not uncommon and may be a cause of chronic cystitis. It too large to pass by natural means stones must be removed by operation. *Acute retention* of urine can occur in any condition in which the urethral

opening is blocked either by a stone within the B., by pressure from without, as from a fibroid growth of the uterus (q.v.), or by an obstruction in the urethra, such as an enlarged prostate gland or a stricture. It may also occur in diseases of the spinal cord which interfere with the neuromuscular mechanism of micturition. Acute retention is relieved by passing a catheter (q.v.) or by making an opening into the B. above the pubic bone—an operation known as suprapubic cystotomy. Benign and malignant new growths of the B. may occur, and the first symptom is often haematuria (blood in the urine). With modern surgical techniques it is now possible to remove a diseased B., the ureters being transplanted into the colon, which then receives the urine excreted by the kidneys. The inside of the B. may be inspected by means of the cystoscope, an instrument which consists in a hollow tube with a light at the end and a series of magnifying lenses. The instrument is passed through the urethra into the B., and with the aid of the light and the lenses the surgeon is able to view every aspect of the interior. The cystoscope may also be used as a means of passing surgical instruments into the B. for the purpose of removing small fragments of tissue for histological examination, and also for passing small catheters into the ureters. Ureteric catheterization is a means of obtaining for analysis specimens of urine excreted by each kidney separately.

Bladder Campion, popular name of the *Silene cucubalus*, a herbaceous plant of the family Caryophyllaceae. Found in waste places and on hedgerows, it has inflated or bladder-like calyx, drooping flowers, and oval leaves.

Bladder-nut (*Staphylea pinnata*), species of Staphylaceae. It is a shrub which grows in N. lands, and has a large, bladdery capsule as its fruit. The seeds are edible and yield oil.

Bladder-seed (*Danae cornubiensis*), perennial plant of the family Umbelliferae, common to Britain, Europe, and W. Asia. The fruit is a schizocarp much inflated.

Bladder-senna (*Colutea arborescens*), species of Leguminosae cultivated in India and S. Europe. The legume dehisces when touched or in a strong wind, and thus scatters the seed. The leaves have properties similar to those of the genus *Cassia*, and are used in the adulteration of senna.

Bladder-worm, or Hydatid, stage in the development of a cestode, or tape-worm. The egg of the tape-worm gives rise to a six-hooked embryo, which reaches the first host. It then develops into the larval form, when a cyst or bladder is formed round the vital portion. When the B. is swallowed by its final host, the scolex or vital portion is everted, the tail is thrown off, and the worm proceeds to develop segments and becomes the complete tape-worm.

Bladderwort, family Lentibulariaceae, genus of aquatic herbs, epiphytes and terrestrial plants, *Utricularia*. Typical Brit. species is *U. vulgaris*, a submerged

aquatic, with much divided leaves, bearing small bladders with trap-door entries, into which insects, small crustaceae, etc., can pass but not return, to decay and be absorbed by the plant. *U. minor* is the Lesser B., and *U. intermedia*, the Intermediate B. Tropical epiphytic species are sometimes grown in hot-houses.

Bladensburg, vil. of Prince Georges co., Maryland, U.S.A., situated on the Anacostia R., 6 m. NE. of Washington. On 24 Aug. 1814 a battle was fought, in which the British were victors, which decided the fate of the cap. Pop. 2900.

Blades, William (1824-90), Eng. printer and bibliographer, became partner in his father's printing business. His interest in the hist. of printing led to the pub. of his *Biography and Typography of William Caxton, England's First Printer*, 1877, in which, by a careful comparison of types, he classified many Caxton eds. In his popular *Enemies of Books*, 1881, he discusses their foes, human and insect. A collector of old books and medals, he took an active part in public work, and was a keen supporter of the Library Association. He actively promoted the organization of the Caxton Celebration Exhibition at S. Kensington in 1877. At his death his library of some 3000 items was purchased by the Governors of St Bride Foundation, forming the nucleus of the well-known typographical library at St Bride Institute, London.

Blueberry, see **BILBERRY**.

Blauenau Ffestiniog, tn of Merioneth, Wales, 9 m. NE. of Portmadoc. It has extensive slate quarries. Pop. 7200.

Blauenavon, tn of NW. Monmouthshire, Wales, with ironworks and collieries. Pop. 10,000.

Blaeu, **Blauw**, or **Blauw**, Willem Janszoon (1571-1638), Dutch cartographer, b. Alkmaar in Holland. A pupil of Tycho Brahé, he excelled all his predecessors in making terrestrial and celestial globes, and founded a notable map-publishing house at Amsterdam.

Blagoveshchensk, tn on the Amur in the Russian Far East, cap., economic and cultural centre of the Amur Oblast (q.v.). Pop. (1956) 85,000 (1914, 76,500; 1939, 59,000). It was founded in 1653, and restored in 1856; 5000 Chinese inhab. were evicted and drowned by Russian troops in 1900 in connection with the Boxer rising.

Blagoyevgrad (formerly Gorna Dzhumaya), tn of SW. Bulgaria, cap. of B. prov. (area 2804 sq. m.), 48 m. SSW. of Sofia (q.v.). It has Rom. remains, and is a health resort and commercial centre. Pop. 14,000.

Blakie, Walter Biggar (1847-1928), historian and publisher, b. Edinburgh, son of a prof. Educ. at Edinburgh Univ. and Brussels, he went to India, where from 1870 to 1879 he was in the Public Works Dept. Returning to Scotland, he ultimately became head of the publishing house of Constable. He did much research in Jacobite hist., and pub. *The Itinerary of Prince Charles Edward Stuart, 1745-46*, 1896, *Edinburgh in the Time of the Occupation of Prince Charles*,

1910, and *Origins of the Forty-five*, 1916. He founded the *Scots Observer* and helped to found the Scottish Geographical Society.

Blaine, James Gillespie (1830-93), Amer. statesman, b. W. Brownsville, Pennsylvania. Of Scots-Irish parentage, he graduated at Washington College in 1847. He studied law and moved to Maine, where he was editor of the *Kennebec Journal* and of the *Portland Advertiser*. He was elected to the Lower House of the state legislature in 1858 as a Republican. In 1862 he was elected to Congress, where he sat for 13 years, being Speaker in the House from 1869 to 1875; he sat for 4 years in the Senate. In 1881 he was appointed secretary of state under President Garfield; he resigned after the assassination of the latter, but held the same office, from 1888 to 1892, under President Harrison. B. was nominated for the presidency in 1884 by the Republican party. The Democrats nominated Grover Cleveland. A campaign of almost unprecedented bitterness ensued. The orator who nominated B. at the Republican convention referred to him as the 'White-plumed Knight.' The Democrats seized upon this for all sorts of grotesque cartoons. The Republicans, who had not been defeated nationally since the Civil war, seemed to be winning the presidency as usual, when a Protestant preacher, who was campaigning for B., uttered the sneer that all that was at the back of Cleveland was 'Rum, Romanism, and Rebellion,' meaning that the liquor interests, the Rom. Catholics, and the 'rebels' of the Confederate S. of Civil war times alone were supporting the Democratic candidate. The speech created intense feeling, and to it is attributed a large share in the defeat of B. B. strongly opposed the issue of paper money during the Civil war and the immigration of Chinese. As secretary of state he was in favour of reciprocity treaties with other nations, but adopted a firm position in the seal-fisheries controversies with Great Britain. He was a ready debater, and resourceful in controversy. He wrote *Twenty Years of Congress* (2 vols.), 1884-1886, and *Political Discussions*, 1887.

Blair, Francis Preston (1791-1876), Amer. journalist and politician, b. Abingdon, Virginia. After graduating at Transylvania Univ., he took to journalism and ed. the *Argus* at Frankfurt. In 1830, as editor of the *Washington Globe* and a member of Jackson's 'Kitchen Cabinet,' he became a powerful influence at Washington, but was ousted by Polk and Calhoun. He then supported Van Buren, and later helped to organize the new Republican party. After Lincoln's reelection in 1864 B. succeeded in persuading Jefferson Davis to appoint a conference for the cessation of hostilities, but the conference proved abortive. After the Civil war he rejoined the Democrats.

Blair, Francis Preston (1821-75), Amer. soldier and politician, b. Lexington, Kentucky, son of the above. He first practised law, then served in the Mexican war, and later became a member of the Missouri

legislature. Elected as Republican to the House of Representatives in 1856, 1860, 1862. He was instrumental in preventing Missouri from joining the Confederacy. In 1868 he was Democratic candidate for the vice-presidency, and from 1871 to 1873 was U.S. senator for Missouri.

Blair, Hugh (1718-1800), author and minister, b. Edinburgh. He was minister of Canongate Church, Edinburgh, in 1743, and in 1754 of Lady Yester's church for 4 years. His *Lectures* were pub. on his resignation of the chair of rhetoric and belles-lettres. His chief fame rests upon his *Sermons*, in 4 vols., which had an extraordinary popularity, and secured him a pension of £200. Time, however, has not confirmed the opinion of his contemporaries.

Blair, James (1656-1743), Scottish author and minister. He went as a missionary to Virginia, 1685. Perceiving the lack of education he endeavoured to collect subscriptions to found a college at Williamsburg, and coming to England obtained the necessary charter; he was appointed the first president. B. was for some time president of the Council of Virginia, and rector of Williamsburg. In 1727 he assisted in compiling *The Present State of His Majesty's Colony in Virginia*.

Blair, John (d. 1782), Scottish chronologist, b. and educ. at Edinburgh. In 1754 his *Chronology and History of the World from the Creation to the Year of Christ 1753* was pub. by public subscription.

Blair, Montgomery (1813-83), Amer. politician and lawyer, b. Franklin co., Kentucky. After service in the Seminole war, he took to the study of law and practised at St. Louis, Missouri. He was mayor of St. Louis (1842-3). Removing to Washington, D.C., he was U.S. solicitor in the court of claims from 1855 to 1858, being associated with Curtis in the Dred Scott case. He was postmaster-general in Lincoln's Cabinet, and from 1861 to 1864 introduced free city delivery, money order system, and the use of railway mail cars. He went over to the Democrats after the Civil war as a consequence of his views on the reconstruction policy.

Blair, Robert (1593-1666), graduated at Glasgow Univ. and became a licensed preacher of the Scottish Presbyterian Church in 1616. Ordained as Bishop of Down, Ireland, in 1623, he was deposed 9 years later for nonconformity. When he was excommunicated in 1634, he set out for New England, but stormy weather drove the ship home again. In 1640 he came to England as one of the commissioners from the General Assembly to explain Presbyterianism to Episcopal clergy. Six years later he was elected moderator of the General Assembly.

Blair, Robert (1699-1746), poet and minister, b. Edinburgh. In 1731 he became pastor of Athelstaneford in E. Lothian. His one outstanding work was *The Grave*, 1743, a poem in blank verse, extending to nearly 800 lines, in some passages sinking to commonplace and in others rising to sublimity. It was illustrated by Wm. Blake (q.v.).

Blair, Robert (d. 1828), Scottish astronomer. He was prof. of practical astronomy at Edinburgh Univ. from 1785 till his death. He is chiefly remembered for his work in optics for the improvement of the telescope.

Blair, Robert, of Avontoun (1741-1811), Scottish judge, son of the preceding, *b.* Athelstaneford. From 1789 to 1806 he held the post of solicitor-general for Scotland, and in 1808 became lord president of the court of session, which office he held till his death.

Blair Atholl, vil. of Perthshire, Scotland, 35 m. NNW. of Perth at the confluence of the Garry and the Tilt. Blair Castle, seat of the Duke of Atholl, is situated $\frac{1}{2}$ m. from the vil.; part of it dates from the 12th cent. Pop. 1557.

Blairgowrie and Rattray, joint burgh of Perthshire, Scotland, on both banks of the R. Erich, 20 m. NNE. of Perth. The prin. industry is rayon, jute, and flax spinning and weaving, the factories for which obtain their power from the Erich. Other industries are agriculture, light engineering, and soft-fruit canning. B. is a summer resort. Pop. 5500.

Blaise, St. see BLASIUS, ST.

Blake, George (1893-), novelist, *b.* Greenock. He was educ. at Greenock Academy and studied law, but after the First World War, in which he was wounded at Gallipoli, he turned to journalism, succeeding Neil Munro as literary editor of the *Glasgow Evening News*. In 1924 he became acting editor of *John o' London's Weekly*, and in 1928 editor of the *Strand Magazine*. His novels are in direct opposition to the sentimental 'kailyard' school, *Mince Collop Close*, 1923, a sordid tale of slum life in Glasgow, being followed by *The Wild Men*, 1925, and *The Path of Glory*, 1929, a war story. Returning to Scotland in 1932 he settled at Helensburgh and pub. sev. works with a Clyde setting, including *Down to the Sea*, 1937, and *The Firth of Clyde*, 1952.

Blake, Robert (1598-1657), parliamentarian, soldier, and sailor, *b.* Bridgwater, Somerset, the son of a merchant-venturer. He attended the free grammar school at Bridgwater, and then went to St Alban's Hall, Oxford, and in 1617 to Wadham College, obtaining his B.A. in 1618. His father *d.* in 1625, and B. probably succeeded to his business. In 1640 he was returned to the Short Parliament as Member of Parliament for Bridgwater. When the Civil war broke out he sided with Parliament, and in Mar. 1643 was a member of the Committee for the Sequestration of the Estates of Royalists in Somerset. In the same year, as a captain, he commanded Prior's Hill Fort in the defence of Bristol against Prince Rupert. He was promoted Lieutenant-colonel and took part in the defence of Lyme (1644) and was then made Governor of Taunton, which he defended from Royalist attacks until finally relieved by Fairfax and Cromwell in July 1645. In the autumn of 1645 he was returned to Parliament again, but, being given the task of reducing Dunster Castle, he did not take his seat until May 1646. He

took the covenant on 24 June 1646, but took no part in the trial of Charles I. On 27 Feb. 1649, he was appointed a general-at-sea, and, in April, began the pursuit of Rupert's Royalist fleet. He blockaded the Royalist fleet in Kinsale and later, in Cadiz, and when the Portuguese refused him permission to attack the Royalists in Cadiz harbour, B. took his revenge by intercepting and capturing a portion of a Portuguese fleet bound from Brazil. The Portuguese king was forced to ask Rupert and his ships to leave Cadiz, and B. was able to pursue and capture or scatter the last remnants of the Royalist fleet. He received the thanks of Parliament and a grant of £1000. During his action against Rupert, B. had been offered the post of major-general of the foot by Cromwell, but being free to accept or remain at sea, he decided to continue at sea. His next task was the capture of the Scilly Isles, which were held by the Royalists, under Sir John Grenville, and after this he went on to reduce the last Royalist strongholds in Guernsey and Jersey. For these services he received the thanks of Parliament, and was appointed a member of the council of state.

When the first Dutch war broke out in 1652, B. defeated Tromp off Dover on 19 May, and routed De Witt on 28 Sept. On 30 Nov. a strengthened Dutch fleet under Tromp met a weakened fleet under B. off Dungeness, and after a fierce battle, B. withdrew into the Thames. B. asked for 'a discharge from this employment so far too great for me,' but the council merely thanked him for his gallant action, and strengthened his fleet. At the battle of Portland, 18-20 Feb. 1653, he decisively defeated Tromp, although he was gravely wounded, and was awarded a gold medal and chain. At the close of the Dutch war, B. with his colleagues Deane and Monck, compiled 'Instructions for the better ordering of the fleet in fighting' which introduced the line ahead formation when going into action. In 1654 B. was elected a Lord Warden of the Cinque Ports and Constable of Dover Castle, and on 14 July was again returned as Member of Parliament for Bridgwater. In Oct. he sailed for the Mediterranean, where the presence of his fleet had a great effect on Europe's politics. He demanded the release of a Brit. ship and Brit. captives from the Bey of Tunis, and being 'insolently' refused, he attacked the shore batteries and destroyed the Bey's fleet in Tunis harbour. He reached England in Oct. 1655, his health undermined, but when Spain declared war, he set sail in Mar. 1656 for the Sp. coast, and in Sept. captured a fleet from Brazil bringing treasure to Spain. He blockaded the coast through the winter, and then went to Santa Cruz, where he destroyed, in a well-fortified harbour, a Sp. fleet of 16 vessels. This victory had far-reaching results, including the collapse of a Sp. invasion of Portugal. The victory of Santa Cruz was a brilliant exploit, and Parliament ordered a day of thanksgiving, while Cromwell sent B. a jewel in the form of the Protector's portrait set in gold and

diamonds. Santa Cruz was B.'s last great action, for, on the voyage home, he *d.* at sea within sight of Plymouth. He was buried in Westminster Abbey, but his body was disinterred at the Restoration, and buried in the churchyard of St Margaret's. See lives by C. D. Curtis, 1934, and R. Beadon, 1935; also J. R. Powell (ed.), *Letters of Robert Blake* (Navy Record Society), 1937.

Blake, William (1757-1827). poet and engraver, b. London, the son of a hosier,

became his skilful, sympathetic assistant in artistic and literary work. His first vol. of poems, *Poetical Sketches*, appeared in 1783, but met with an indifferent reception. In 1784 he opened a print-seller's shop, having as assistant his younger brother Robert, who *d.* in 1787. In that year he experimented in printing with etched copper-plates, and it is related that the secret of this process was revealed to him in a vision by his brother, Robert. Others, however, say that he learned the



AN ENGRAVING FROM BLAKE'S 'BOOK OF JOB'
'Let the day perish wherein I was born.'

James B., who had a business near Golden Square. His father seems to have been a disciple of Swedenborg (q.v.), who had prophesied that the year 1757, the date of B.'s birth, would be the beginning of a new world. Visionary by nature, B. as a child saw visions and conversed with angelic beings and in early manhood was for a time a professed Swedenborgian (q.v.) much influenced by the doctrines of the Swedish mystic. He early showed a taste for art, and at the age of 10 he was sent by his father to Pars's drawing-school in the Strand, and at 14 he was apprenticed to the engraver Basire, who set him to drawing monuments in old London churches, thus inducing his love of Gothic art. In 1778, after studying for a short time at the Royal Academy, he became an independent engraver, producing some of the early work of Stothard, and making the acquaintance of Flaxman and Fuseli. In 1782 he married Catherine Boucher, daughter of a market-gardener, who

process through his friend, George Cumberland, of Bristol (Geoffrey Keynes). Be that as it may, B. conceived the idea of engraving his poems and illustrating them with his own conceptions. In 1789 he issued *Songs of Innocence*, the book being entirely designed and produced by himself and his wife. In the same year appeared the *Book of Thel*, the first of his 'prophetic books,' a prophet to B. being a poet, in the sense of one inspired. These were followed by *The Marriage of Heaven and Hell*, 1790, *The Gates of Paradise*, 1793, *America*, 1793, *The Vision of the Daughters of Albion*, 1794, *Songs of Experience*, 1794, *Europe*, 1794, *The Book of Urizen*, 1794, *The Song of Los*, 1795, *The Book of Ahaniah*, 1795, *Jerusalem*, 1804, and *Milton*, 1804. From 1800 to 1803 he lived at Felpham in Sussex with Hayley, for whose *Life of Cowper* he engraved the illustrations. After 1804 he devoted himself to illustrative work, which included engravings for Blair's *The Grave*,

and to designs (which were great original conceptions rather than illustrations) for *The Book of Job*, 1821, *Paradise Lost*, 1822, and the *Divina Commedia*, 1825. His artistic work reveals great natural genius, and is unique in its imaginative design. His place among poets is assured by his lyrics alone, and the prophetic works have yielded much of great interest to sympathetic interpretation. See life by A. Gilchrist, 1863 (reprint by Graham Robertson, 1907). There was also an enlarged ed. of Gilchrist's work in 1880, which has been reprinted, with notes, by Ruthven Todd, in Everyman's Library, 1942, and revised, with additional notes and copious bibliography, in 1945. *Poems*, ed. by Alice Meynell, 1911, and Max Plowman, 1927. *Poetry and Prose*, ed. by Geoffrey Keynes, 1927. See Max Plowman, *An Introduction to the Study of Blake*, 1927; O. Burdett, *William Blake* (Eng. Men of Letters series), 1927; J. Wicksteed, *Commentaries on The Book of Job and Jerusalem*, 1954; *The Notebook of William Blake*, ed. by Geoffrey Keynes, 1935 (includes the *Rossetti Manuscript*); Facsimile of *Jerusalem* (Blake Trust), 1954; Sir Geoffrey Keynes (ed.), *Pencil Drawings of William Blake*, 1957. For the bi-centenary celebrations a bronze bust by Sir Jacob Epstein was unveiled in Westminster Abbey.

Blakeney, William, Baron (1672-1761), Eng. soldier. He is said to have been the first to employ colour or drum to drill companies. Throughout Marlborough's campaigns he served as adjutant to his regiment. The enmity of Lord Verney hindered his advancement, so that he was 65 before he was promoted colonel. The Duke of Richmond, however, secured him the lieutenant-governorship of Stirling Castle in 1746, having recognised his gallant services in the Cartagena expedition of 1741. His successful defence of that castle against the Highlanders led George II to appoint him lieutenant-governor of Minorca in 1747. As the governor never appeared, he undertook the defence of the is. against the Fr. troops under Richelieu and La Gallissonnière at the commencement of the Seven Years War, 1756. Adm. Byng, who was afterwards executed for cowardice, came with a relieving squadron, but sailed away again, thus leaving B. no alternative but to surrender. Many honours, including the command of the Inniskilling regiment of infantry, awaited the veteran on his return home.

Blakeney, vill. on the N. coast of Norfolk, England, 5 m. from Holt. Good sailing is to be had on a lagoon-like stretch of sea, and at B. Point there is a bird sanctuary of over a thousand ac. in extent. Pop. 641.

Blakesley, Joseph Williams (1808-85), dean of Lincoln, b. in London. He was educ. at St Paul's School and Corpus Christi and Trinity Colleges, Cambridge, becoming fellow and tutor of the latter college. He became dean of Lincoln in 1872. A *Life of Aristotle*, 1839, and an ed. of Herodotus, 1852-4, were his chief works.

Blakiston, Thomas Wright (1832-91), explorer, b. Lymington, Hants. Joining the army in 1851, he saw service in the Crimea and elsewhere. His chief work as an explorer was done on the upper course of the Yang-tse-Kiang in 1861. From 1863 to 1884 he was a merchant in Japan, and there interested himself in ornithology. He d. in California.

Blamire, Susanna (1747-94), poetess, b. near Carlisle, daughter of a farmer, received the sobriquet of 'The Muse of Cumberland.' Her poems, which were not collected till 1842, depict Cumbrian life with truth and vivacity. She also wrote some fine songs in Scottish dialect, such as 'Ye shall walk in silk attire.'

Blamire, William (1790-1862), agriculturist. He graduated at Christ Church, Oxford, and then took up farming near his home at Dalston, Cumberland. He became popular with the yeomen of the co., because he was always willing that his neighbours should profit by his experiments in agric. improvements, and in 1828 he was appointed high sheriff, and 3 years later, after an exciting election, was returned to Parliament as a representative of the Whig party. In 1836 he made a remarkable speech on the Tithe Commutation Bill, and, when it became law, was nominated chief commissioner to supervise its administration. The work of assessing the rent charges for each par. and of apportioning those charges between various properties was complicated by the lack of reliable maps, and lasted from 1836 to 1851. It was at B.'s suggestion that the ordnance survey of 1842 was undertaken. His practical and expert knowledge of land tenure also rendered his assistance invaluable to the gov. in preparing both the Copyhold Enfranchisement Act of 1841, and still more the Commons Enclosure Act, 1845. The principles he laid down in a Highways Bill of 1846 have guided all later legislators on that subject.

Blanc, François, Fr. financier, originally the owner of a casino in Homburg. See MONTE CARLO.

Blanc, Jean Joseph Charles Louis (1811-1882), Fr. politician and historian, b. Madrid. He studied law at Paris, and contributed to various progressive journals. He founded the *Revue du progrès* in 1839, and pub. in it an article on 'L'Organisation du travail,' which embodies the principles which guided him all his life. In this article he stated his view that competition is the main evil of industry. For a remedy he proposed equalisation of wages, national workshops, and declared that personal interests are of less importance than the welfare of the community. After the revolution of 1848, he became a member of the provisional gov. and presided over a gov. commission to report on labour questions. The national workshops he had advocated were estab. but gov. hostility predetermined their failure. B. was unjustly charged with complicity in the disturbances which followed. He took refuge in England, and remained here until the downfall of the empire. There he completed his *Histoire de la*

Révolution Française, in 12 vols. (1847-1862). On his return to Paris he was in 1871 elected a member of the National Assembly. Though he possessed a vivid style and relied a good deal on detailed research, his writings are too political in tone to be of any real historical value. His works have, however, considerably influenced socialist opinion in France.

Blanc, Mont, 15,782 ft, is the highest mt in the entire chain of the Alps, and in Europe with the exception of certain

and Jacques Balmat. In the following year Jacques Balmat and 2 local men again made the ascent, whilst later in 1787, the Genevese naturalist, to whom a statue has been erected at Chamonix, H. B. de Saussure, made the third ascent. The first Englishman to attain the summit was Col. Beaufoy (1787). These ascents were all made from Chamonix, which is the usual starting-place, though in the course of time ascents have been made from every side. The easiest route is by way of the inn of the Grands Mulets, from



D. McLeish

MONT BLANC

The huge Bossons and Tacconnaz glaciers from the NW.

peaks in the Caucasus Mts. It rises to the S. of Chamonix, in Fr. ter., and to the NW. of Courmayeur, which belongs to Italy. When the treaty which ceded Savoy to France was ratified in 1861 France had the highest summit. The whole range bearing the name M. B. forms part of the Pennine Alps and is unequally divided between France, Italy, and Switzerland. In former days the mt was called in some places the Montagne Maudite, or simply Les Glacières, but the present name appears to have been always in local use; the name M. B. occurs in an It. document of the year 1694. Its old name, Les Glacières, had its origin in the distinguishing feature of the mt, the immense glaciers which are found on all sides of it. Among the best known may be mentioned those of Bossons and Tacconnaz, on the N. slope, and those of Brenva and Miage on the S. slope. The first ascent of M. B. was made in 1786 by 2 Chamonix men, Dr Michel Paccard

Chamonix, to the Bosses du Dromadaire shelter-hut, and thence to the summit. Miss Isabella Straton, in Jan. 1876, was the first to make an ascent in winter. The view from the summit of the mt is naturally extensive, Lyons being visible. The inn at the Grands Mulets stands at a height of 9909 ft, the shelter-hut at the Bosses du Dromadaire, built in at a height of 14,312 ft, whilst in 1893 an observatory was constructed just below the summit by T. J. C. Janssen. See A. W. Moore, *The Alps in 1864*, 1867; C. E. Mathews, *The Annals of Mont Blanc*, 1898; Sir C. Schuster, *Peaks and Pleasant Pastures*, 1911; M. Kurz, *Guide de la Chaîne du Mont Blanc* (4th ed.), 1935; T. Graham Brown, *Brenva*, 1943; T. Graham Brown and Sir Gavin de Beer, *The First Ascent of Mont Blanc*, 1957.

Blanca Peak, estimated to be the highest peak in Colorado, U.S.A. It is in the co. of Costilla, and is among the Sangre de Cristo Range. Its altitude is 14,363 ft.

Blanch, or **Blench**, **Holding**, name of one of the anct feudal tenures in the law of Scotland. Under this holding the vassal has to pay to the superior only a nominal duty, as a badge of servitude, such as a penny Scots, a bunch of roses, or, as in the case of Jock Howieson, the service of a ewer and basin in order that the king may wash himself. It is now seldom adopted in the constitution of the original right of property.

Blanchard, **Edward Litt Laman** (1820-1889), miscellaneous writer, b. London. He was the author of a number of dramas, farces, and burlesques. For 37 years he wrote the Drury Lane pantomime, and he sold plays to prov. theatres at 10s. an act. As dramatic critic he contributed to many papers, among them being the *Weekly Dispatch* and *Daily Telegraph*. From 1841 to 1845 he was in turn editor of 3 papers. He also wrote 2 novels, countless comic songs, and illustrated guides to places of interest. See life by Clement Scott, 1891.

Blanchard, **Jacques** (1600-38), Fr. painter, b. Paris. He studied under his uncle. In 1624 he visited Rome, and 2 years later Venice. Here he studied the paintings of Titian and others. He returned to Paris and executed numerous works. In virtue of these he was called the Fr. Titian. 'The Descent of the Holy Spirit,' which hangs in Notre-Dame, is considered his best painting.

Blanchard, **William** (1769-1835), comedian, was prompted by his delight in Shakespeare to become an actor. In 1785 he joined Mr Welsh's travelling company, and after an unsuccessful attempt as a theatre manager, made his debut at Covent Garden as Bob Acres, in 1800. With this theatre he was connected until 1834, except for one break when he toured in America. In his youth he was favourably compared with John Kemble, and was especially famous for his Shakespearean impersonations of Fluellen, Polonius, and Menenius, whilst Leigh Hunt enjoyed above everything his interpretation of the role of the Marquis de Grand-Château in the musical play, *The Cabinet*. De Wilde painted him as Sir Andrew Aguecheek.

Blanche, **Jacques Emile** (1861-1942), Fr. painter and art critic; educ. at the Lycée Fontanes, where Mallarmé was his Eng. master. Encouraged by Manet and Renoir, he set up a studio at Bas Fort Rouge, Dieppe, where he was often visited by Sickert, who became one of his closest friends. His work shows the strong influence of Manet, Degas, and, later, the early Eng. portrait school, in the style of which he produced a successful series of portraits of women. Portraiture was his main study, and his best portraits include those of Beardsley, Debussy, Degas, Henry James, Maeterlinck, Ricketts, and Rodin. He wrote much art criticism, especially in the *Revue de Paris* and *L'Art Vivant*; he also wrote novels and reminiscences, including *Cahiers d'un artiste*, a work which notably influenced Proust's *À la recherche du temps perdu*. His short stories appeared under the nom de plume

of Jaime de Beslou. He also pub. 2 books of memoirs: *Portraits of a Lifetime*, 1937, and *More Portraits of a Lifetime*, 1918-38, 1939, containing vivid sketches of international celebrities.

Blanche, **Dent**, Alpine peak in the canton of Valais, Switzerland, rising to the W. of Zermatt and opposite to and N. of the Matterhorn. Its altitude is 14,318 ft. The ascent, which presents great difficulties, was first made by T. S. Kennedy and W. Wigram in 1862.

Blanchefleur, see FLOIRE ET BLANCHE-FLEUR.

Blanching, or **Etiolation**, horticult. method of growing certain plants and vegetables to render them more succulent. The exclusion of light produces stoma and leaves free from chlorophyll, green colouring matter. Many vegetables are made more tender and tasteful by B. B. is usually an artificial process, though a kind of natural etiolation may be observed in the cabbage. There are 4 main ways of B. plants: (a) By earthing up the leaves and stems of plants. This practice is followed in the case of celery, asparagus, etc. Celery is planted in trenches, and earth is drawn up round the plants as they grow. (b) By tying up the leaves with pieces of bass; this is the method adopted in the case of cos lettuces, and sometimes with endive. (c) By wrapping up stems in opaque paper or cardboard. (d) By overlaying with tiles, slates, or B. pots, which are earthenware vessels of a sugar-loaf shape. By this means the light is excluded from seakale, rhubarb, etc., and no green appears in the leaves. The B. pot is often employed in France for lettuce, and in the Pyrenees celery is blanched by this means. Cardoons are blanched by tying up each plant into a long, oval, and compact bunch. A drainpipe later filled with sand is then placed over each plant, or they are earthed up after the fashion adopted with celery. B. has very important results. Not only is growth made more succulent and less fibrous, but less bitter in flavour, and blanched celery, seakale, chicory, rhubarb, and dandelion are much improved.

Blancmange (O.F. *blancmanger*, 'white food'), originally a dish of fowl minced with cream, rice, almonds, sugar, eggs, etc. It is now a sweet dish made of corn-flour, gelatine or isinglass, and milk.

Blanco, **Antonio Guzman** (1828-99), Venezuelan soldier and a native of Caracas. The Federal revolts of 1859-63 saw him actively engaged. He became vice-president under Falcón in 1863. By a counter-revolution he triumphed over an attempt to depose him, and became president on the death of his superior. A series of re-elections skillfully manipulated kept him in office till 1888.

Blanco, **Cape**, headland on the W. coast of Africa, in 20° 47' N. lat. and 16° 58' W. long. It lies at the end of a rocky ridge projecting from the W. extremity of the Sahara.

Bland, **Edith**, who wrote under her maiden name of Nesbit (1858-1924), novelist and writer of children's books, was brought up in Kent. She married

Hubert B. in 1880 and wrote many articles, stories, and poems, but found her true vocation when *The Treasure Seekers*, a story for children, brought her financial success in 1899. *The Would-Be Goods*, 1901, and *Five Children—and It*, 1902, were other favourites among her books, which struck a new note by portraying young folk as real human beings. In 1915 she was granted a Civil List pension. See life by D. L. Moore, 1933.

Bland, Humphrey (1686-1763), Eng. soldier and military writer, served against the Jacobite rebels in 1715 and also in 1745-6 when he was major-general in the Culloden campaign. It was whilst he was lieutenant-colonel of the king's dragoon guards that he pub. his *Treatise on Discipline*, 1727, which served for many years as the recognized textbook on that subject. He distinguished himself at Dettingen and Fontenoy during the Flanders expedition. From 1749 he was governor of Gibraltar, till he was appointed in 1753 commander-in-chief of the Scottish forces—a post which he held to his death.

Bland, Maria Theresa (1769-1838), It. vocalist, b. probably in Italy of Jewish parents named Romanzini. Her first appearance in London was in 1773, and after a successful time at Dublin she appeared at Drury Lane in 1786. She was connected with this theatre almost continuously until 1824, when an attack of melancholia obliged her to renounce the stage. She also sang at Vauxhall and the Haymarket Theatre. She was remarkable for the sweet quality of her voice (mezzo-soprano) and her unaffected style, whilst as an actress it was her vivacity that charmed.

Bland-Sutton, Sir John (1855-1936), surgeon, b. Rnfield, Middx. The son of poor parents, he was trained as a teacher but determined to become a surgeon. He entered the Middlesex Hospital in 1878 and remained associated with that institution for the rest of his life. He qualified in 1881, became assistant surgeon to the Middlesex in 1886, and full surgeon in 1905. He was a fellow of the Royal College of Surgeons and its president, 1923-6. In his early years he carried out a great deal of research work, particularly on comparative anatomy, embryology, and pathology. He was a brilliant operator, with the faculty of instant appreciation and decision. From 1896 to 1911 he was also surgeon to Chelsea Hospital for Women, and became a leading gynaecological surgeon. He was convinced that a wide knowledge of pathology was essential in all medical teaching, and in 1912 he presented to the Middlesex Hospital the Institute of Pathology which now bears his name. He was knighted in 1912 and given a baronetcy in 1925. He wrote *Ligaments, their Nature and Morphology*, 1887, *Surgical Diseases of the Ovaries*, 1891, *Tumours, Innocent and Malignant*, 1893, *Gall-Stones and Diseases of the Bile Ducts*, 1907, *On Faith and Science in Surgery*, 1930, and sev. other works. See his autobiography, *The Story of a Surgeon*, 1930, and life by W. R. Bett, 1956.

Blandford Forum, tn of Dorset, England, on the R. Stour, 16 m. N.E. of Dorchester by road. It was almost destroyed by fire in 1731. There are many Rom. and prehistoric remains in the vicinity. There is a large military camp and an aerodrome in the dist. Pop. 3500.

Blandrata (properly **Blandrata**), **Giorgio** (1516-88), Unitarian, b. of an old Piedmontese family and educ. in France. He early attached himself to the left wing of Protestantism, and fomented the anti-trinitarian heresy of the It. Church of Geneva. He had been obliged to flee from Montpellier to Geneva in 1556 because of his heterodoxy, and there he remained until in 1558 Calvin's wrath drove him to Poland, where Unitarianism was gaining ground. Finally he took refuge in Transylvania where, as physician to John Sigismund, the prince, and in association with Francis David, he was able to spread his doctrines over a wide field. He secured legal recognition for Transylvanian Unitarianism and thus ensured its continued existence.

Blane, Sir Gilbert (1749-1834), physician, b. Blaneffield, Ayrshire. At 14 he went to Edinburgh Univ., originally to study for the Church, and ultimately for a doctor's career. He took his M.D. degree at Glasgow Univ. in 1778. In 1779 he went to the W. Indies as physician to Adm. Rodney, and from that time he was physician to the fleet. He wrote accounts of sev. engagements and victories which he witnessed, and he received a pension from the Crown. In 1781 he accompanied Rodney home. He introduced reforms while he had medical charge of the W. India fleet, including the issue of citrus fruits to prevent scurvy. He helped in drawing up the rules for the Quarantine Act of 1799. He was made a baronet in 1812.

Blanesburgh of Alloa, Robert Younger, Baron (1861-1937), Judge, youngest son of James Younger, of Alloa, co. Clackmannan, and brother of the 1st Viscount Younger of Leckie. Educ. at Edinburgh Academy and at Balliol College, Oxford, of which he was made honorary fellow, 1916. Called to the Bar (Inner Temple), 1884; took silk 1900. Judge of the chancery div. of the High Court, 1915-19; Lord Justice of Appeal, 1919-23; Lord of Appeal in Ordinary and life peer, 12 Oct. 1923. He was very rapid in thought and fluent in language.

Blanford, Henry Francis (1834-93), geologist and meteorologist, studied at the Royal School of Mines and at Freiberg, Saxony. As a member of the Geological Survey of India, he classified the Cretaceous strata near Trichinopoly. Later he was appointed meteorological reporter to Bengal, in which capacity he made discoveries about the cause of cyclones and also pub. treatises dealing with the meteorology of India. In 1880 he was elected F.R.S., and in 1884 president of the Asiatic Society of Bengal.

Blanford, William Thomas (1832-1905), geologist, b. in London; educ. at the Royal School of Mines, London, and later at the Mining Academy, Freiberg, Saxony.

He was a member of the geological survey of India from 1855 to 1882, being detached for work in Abyssinia in 1867-8 and in Persia in 1872. President of the geological section of the Brit. Association in 1884, and pub. *Observations on the Geology and Zoology of Abyssinia*, 1870, *A Manual of the Geology of India*, 1879, and *Mammalia*, 1888-91.

Blank Verse, verse without rhyme. In its wider sense the term B. V. signifies all verse in which the rhymes are lacking, but the term has come to have a more restricted significance, being generally applied to verse consisting of ten-syllable iambic lines. The major part of Eng. dramatic and epic poetry is written in B. V. of this measure. It was first used by the Earl of Surrey (q.v.) in his trans. of the *Aeneid*, and popularized for epic use by Milton. Later skilful users of B. V. were Thomson, Cowper, Wordsworth, Tennyson, and Bridges. See also POETRY and VERSE.

Blankenberghe, small tn on the coast of W. Flanders, Belgium, 13 m. N.E. of Ostend. It has a fishing industry, and shipbuilding is carried on. The normal pop. is 9700, but this is swollen in summer when B. becomes one of the most popular seaside resorts of Belgium.

Blankenburg, Ger. tn in the dist. of Magdeburg, 37 m. SW. of Magdeburg (q.v.). It is at the foot of the Harz Mts (q.v.), and has an 18th-cent. castle which was the residence of Louis XVIII (q.v.), 1796-8. It has an iron industry and seed nurseries, and is a health resort. Four m. SSW. on the Bode R. is the Bodetalsperre (dam) with hydro-electric installations. Pop. 18,500.

Blankenburg, Ger. spa in the dist. of Gera, on the Schwarza, 38 m. WSW. of Gera (q.v.). It is overlooked by the ruins of the medieval Greifenstein castle, and has a fine church (14th-18th cents.) and 18th-cent. inn hall. There are manufs. of wool, paper, and precision instruments. Pop. 6600.

Blanket, woollen or cotton fabric used as a covering on beds, etc. Whilst all good B.s are made wholly of wool, B.s of inferior quality are made of cotton warp and woollen weft. In these B.s the threads of the woollen yarns are raised to the face of the fabric in a loose, soft mat so as to hide the cotton threads. The process by which this is done is called teaselling, and it is effected by means of steel brushes called teasels, which are fixed in gigs, or brushing machines, and brush up the threads on the face of the B. The prin. varieties of Eng. B.s are the Witney, the Kersey, the Yorks, the Bath, and the Bury, the last named being more like ordinary wool cloth. The Scotch B.s are always made wholly of wool, and are more durable than the Eng., though sometimes not so comfortable. The prin. Scottish mills are in Ayrshire, Berwickshire, and at Markinch in Fifeshire. Very delicate B.s come from Mysore, in India, being made of such fine fabric that they can be rolled up into a small compass.

Blanketeers, nickname given to the

Lancs operatives, who met in St Peter's Field, near Manchester, on 10 Mar. 1817. They determined to march to London and see the prince regent in order to obtain redress of their grievances. The Habeas Corpus Act was suspended, and the leaders were imprisoned, whilst the bulk of the operatives gave in. The name B. was given to them because each carried a blanket for camping out.

Blankney, vil. of Lincs, England, 8 m. from Sleaford by rail. Centre of a famous hunt. Pop. 600.

Blanqui, Jérôme Adolphe (1798-1854), Fr. economist, b. Nice. He was a schoolmaster in Paris, when he was caused to study economics by reading the works of J. B. Say, whose pupil and assistant he became. He was appointed to a professorship of industrial economy and of hist. at the Conservatory of Arts and Commerce, upon Say's recommendation, and succeeded the latter as prof. of political economy in 1833. In 1838 he became a member of the Academy of Moral and Political Sciences. His most important work is his *Histoire de l'économie politique en Europe*, 1838.

Blanqui, Louis Auguste (1805-81), Fr. politician, b. Pujet-Théniers, near Nice. He studied both law and medicine before taking up a political career. He took part in the 1830 revolution. He was leader of the extreme Socialist party after the revolution of 1848, but was sentenced to 10 years' imprisonment in 1849, and again in 1861, but escaped and went abroad till after the downfall of the empire, when he returned and founded *La Patrie en Danger*. On 31st Oct. (1870) the National Guard, led by B., came into conflict with the gov. troops, and for a brief space he became head of a provisional gov. But following the fall of the com. in May (1871) B. was sentenced to death, the sentence being subsequently commuted to life imprisonment. He was freed before his death.

Blantyre (Gaelic, 'warm retreat'): 1. Par. of Lanarkshire, Scotland, 8 m. SE. of Glasgow, comprising Blantyre, High Blantyre, and Stonefield. It is the bp. of David Livingstone, whose home and property is now a national memorial (open to the public). Ruins of B. priory, founded late 13th cent., can be seen further along the bank of the R. Clyde. Formerly a coalmining dist., B.'s industries comprise mining, engineering, and general trades on a large industrial estate. Pop. 17,000.

2. Tn of Nyasaland Protectorate, important commercial centre, 350 m. by rail from the port of Beira, Portuguese E. Africa. B. is situated in the Shire Highlands at foot of Mchiru Mt. The Church of Scotland Mission, in 1876, estab. its H.Q. 2 m. away, and the residence of its head is said to be the oldest European dwelling between the Zambesi and Khartoum. Here is the airport of Nyasaland. Pop. (dist.): Europeans, 1000; Asians, 1500; Africans, 5000.

Blaps, genus of black beetles which numbers more than 100 species. They are dark, wingless, and slow in movement; of

nocturnal habits, they feed on dead vegetable matter, and possess the power of ejecting an acrid fluid with a pungent odour for a distance of sev. inches. A common Brit. species is the *B. mortisaga* or 'churchyard' beetle, which used to be considered as the harbinger of death. The species *B. sulcata*, when cooked in butter, was used as a food in Turkey, especially by women, as it was believed to be fattening.

Blarney, small tn. co. Cork, Rep. of Ireland, 5 m. NW. of Cork. Contains an old castle, built on the site of a still more ant. one founded in 1446 by Cormac McCarthy. The noted 'B. stone,' which is supposed to confer the power of persuasive eloquence on all who kiss it, is situated about 20 ft from the summit. Pop. 885.

Blasco-Ibañez, Vicente, see IBAÑEZ.

Blasius, or **Blaise**, St. Bishop of Sebaste in Asia Minor, who, according to his legend, was martyred in the reign of Diocletian, c. 303. His feast is on 3 Feb. He is the patron saint of woolcombers, as his flesh was said to have been torn by their irons, and he is invoked against diseases of the lungs and throat.

Blaskets, 7 is. off the W. coast of co. Kerry, Rep. of Ireland, near Sleat Head. Great Blasket is 4 m. by $\frac{1}{2}$ m. See M. O'Sullivan, *Twenty Years A-growing*, 1933.

Blasphemy, insulting and opprobrious speech offered to God or persons or objects esteemed sacred. Among the canonists the definition of B. is made to include the denying of God, or the asserting of anything to be God which is not God. Blackstone describes B. at common law as comprising 'the denying the being or providence of God, contumelious reproaches of our Saviour Christ, profane scoffing at the Holy Scripture, or exposing it to contempt and ridicule.' The punishment is fine and imprisonment. The 9 Will. III, c. 35, enacts that if any person educ. in or having made profession of the Christian religion should by writing, printing, preaching, teaching, or advised speaking deny any one of the persons of the Holy Trinity to be God, or shall assert that there are more Gods than one, or shall deny the Christian religion to be true, or the Holy Scripture to be of divine authority, he shall upon the first offence be rendered incapable of being a guardian or executor or of taking a legacy or deed of gift, and suffer 3 years' imprisonment. According to the decision in *R. v. Carlisle*, the statute is cumulative in operation and in principle merely declaratory of the common law, although apostasy is constituted by the statute a distinct substantive offence included in B. But it has been held that the offence does not consist in an honest questioning of the truths of the Christian religion, but rather in a wilful intention to pervert, insult, and mislead others by means of licentious and contumelious abuse applied to sacred subjects. The disputes of the learned on religion are not punished as B. (*R. v. Woolston*). Whether these latter dicta be sound common law

or not, they are in harmony with the trend of public opinion against putting in active operation the law of B. in all its rigour. Smith's Act, 1813, relieves 'persons denying as therein mentioned' the doctrine of the Holy Trinity. Publications which assail in an indecent and malicious spirit Christianity or the Scriptures in language calculated and intended to shock the feelings and outrage the belief of mankind, are regarded as blasphemous libels (*R. v. Bradlaugh*). The law is rarely put in force.

Blaas, Friedrich (1843-1907), Ger. scholar, b. Osnabrück, Hanover, prof. at Kiel Univ. from 1881 to 1892, and at Halle Univ. after 1892. He ed. numerous classical texts, notably the orations of Aeschines, Andocides, Antiphon, Demosthenes, Dinarchus, Hyperides, Isocrates, and Lysurgus. His other works include *Philarch, Tibertus und Gaius Gracchus*, 1875, *Die attische Beredsamkeit*, 1887-98, *Die Aussprache des Griechischen*, 1888, *Bachylidis Carmina*, 1898, and *Grammatik des neustamentlichen Griechisch*, 1902.

Blast Furnace, see FURNACES; IRON AND STEEL; METALLURGY.

Blasting, method of shattering or loosening masses of mineral, rock, coal, or obstruction by the discharge of an explosive. It is used both in excavation or tunnelling where the material has no particular value, and in mining, where the material has to be recovered, often in a certain state of coherence. In B. for the purpose of loosening obstructing rock, a large charge of a B. explosive or a series of charges round a central core is used, the effect being to fragment the material for a certain limited distance around a given point, the debris being then removed by ordinary pick or navvy work. In B. for minerals of economic value it is usually advisable to break up the material, often along the natural lines of cleavage. Small charges are therefore used, and the material can then be removed in bulk without the admixture of foreign substances and the over-pulverisation that a shattering charge would cause. To effect B. holes are drilled in the material of varying depth according to the fragmentation required, from a few feet to the full depth of the quarry face. The number, distance from the face and each other, relation to the strata and cleavage planes, and general positioning of these drills is of importance no less than the quantity and strength of the B. explosive used. The explosive is usually provided in round tins of about 10-lb. charge each, and these are let down into the drill hole on top of each other sometimes with prearranged blank spacings at intervals. The charges are set off usually by electric detonator. Delay effects along the charges, and between drills, are employed to enhance the required disruption per unit weight of explosive and size of fragments. Primers are frequently used to ensure satisfactory detonation throughout. See also CHEDDITE; DYNAMITE; EXPLOSIVES.

Blastoderm, first mass of primitive cells

which forms around the protoplasm in the ovum.

Blastoids, group of extinct stemless or short-stemmed pelmatozoan echinoderms with a bud-like skeleton made of relatively few calcareous plates which are symmetrically arranged. They possess an elaborate system of enclosed canals or hydrospires, which probably served a respiratory function. They existed from Ordovician to Permian times, but were particularly abundant in the Carboniferous (e.g. the genus *Pentremites*).

Blatchford, Robert (1851-1944), journalist, b. Maidstone, the son of an actor. After being an apprentice to brush-making, a soldier in the Dublin Fusiliers, and a clerk at Northwich, he became a journalist, and was connected with the *Sunday Chronicle* from 1885 to 1891. In 1891 he started the *Clarion*, and chiefly under the nom de plume of 'Nunquam' contributed articles of a socialistic and agnostic character, which did much to popularise Socialism among Brit. working people. The simplicity and genial humour of his style made his writings popular even among those who did not share his economic and religious views. His ideals owed much to Wm Morris, and were but little influenced by Marxian economic theories. His pub. works include *Merric England*, 1894, *Tommy Atkins*, 1896, *Britain for the British*, 1902, *God and my Neighbour*, 1903, *Not Guilty, a Plea for the Bottom Dog*, 1905, and *As I Lay a-Thinkin'*, 1926.

Blattidae, family of insects of the order Orthoptera, which includes the cockroaches (q.v.), often improperly called black-beetles. There is a large number of species found in all lands as active and extremely voracious insects. The head is hidden by the thorax, and the antennae are long and thread-like. The common cockroach of Eng. kitchens is *Blatta* (or *Periplaneta*) *orientalis*, said to have come originally from Asia.

Blavatsky, Helena Petrovna (1831-91) (née Hahn), usually known as Mme B., theosophist, b. Ekaterinoslav, Russia, on 31 July (O.S.). Married at 17, she left her husband after 3 months, and in later years described the marriage as nominal only. She travelled in Asia, S. America, Africa, and India, and on her return in 1858 declared that she had been initiated into esoteric Buddhism, and could perform supernatural feats by the aid of 'mahatmas,' her spiritual tutors. In 1875 she founded the Theosophical Society, whose objects are: (1) To form a nucleus of the Universal Brotherhood of Humanity, without distinction of race, creed, sex, caste, or colour. (2) To encourage the study of comparative religion, philosophy, and science. (3) To investigate unexplained laws of nature and the powers latent in man. Her books, which include *Isis Unveiled*, 1877, *The Secret Doctrine*, 1888, and *The Key to Theosophy*, 1889, are a curious mixture of magical and cabalistic lore, theosophy, and more or less esoteric Buddhism. She d. in London. The secret powers she claimed were rejected by the London

Society of Psychical Research. See E. Garrett, *Isis very much Unveiled*, 1884, and F. Podmore, *Studies in Psychical Research*, 1895. Also under THEOSOPHY.

Blavet, River, coastal riv. of France, which rises in the Landeret Hills and flows into the Atlantic at Port Louis. It crosses the B. swamp, and the Scorff R. flows into it at Lorient. The length of its course is about 87 m.

Blavia, see BLAYE.

Blaydes, Frederick Henry Marvell (1818-1908), scholar, b. Hampton Court Green, a descendant of Andrew Marvell. He was educ. at St Peter's School, York, and Oxford Univ. He took holy orders, and became vicar of Harringworth, Northants, in 1843, holding the benefice until 1886. He ed. numerous classical texts, and his pub. exercised a distinct influence on the study of the classics at public schools during the latter part of the 19th cent.

Blaydon, tn in Durham, England, on the R. Tyne, 4 m. SW. of Newcastle with which it is connected by a bridge. It has manufs. of bricks, paint, and fertilisers, and there are collieries, iron foundries, and coke ovens. Pop. 30,500.

Blaye (ancnt Blavia), Fr. tn., cap. of an arron., in the dept of Gironde. Its citadel is part of a defensive system built by Vauban (q.v.) on the Gironde estuary. It has a trade in wines, fruit, and wood. Pop. 3800.

Blayne, Andrew Thomas, Baron (1770-1834), lieutenant-general, was gazetted major of the 89th regiment, part of which he had raised himself in 1794. He joined the Duke of York, who was fighting in Flanders, and experienced all the perils and misery of the retreat through Holland, 1794-5, but in many of the encounters he gained signal distinction. After assisting Lord Cornwallis in suppressing the Irish Rebellion in 1798, he helped in the reduction of Malta. During the Peninsular war he made a disastrous descent on Málaga. In his *Narrative of a forced Journey through Spain and France as a Prisoner of War*, 1810-14 he describes his own experiences and the state of the 2 countries.

Blazon and Blazonry (derivation uncertain. Wyld gives O.F. *blasen* 'sheld,' later 'coat-of-arms'; but the Fr. word may come through Ger. *blasen*, 'blow' or 'proclaim'), heraldic terms which originated with the custom of blowing a trumpet to announce a knight's entrance into the lists at a tournament; the knight's coat-of-arms was explained in heraldic phraseology by the heralds who called his name. Thus B. and B. came to mean the art of describing a coat-of-arms in such a way that any one who possessed a technical knowledge could accurately portray it from the description. See HERALDRY.

Blea Tarn (Blue Tarn), name of 2 small lakes in the Eng. Lake Dist.: (1) in Cumberland, on the moor between Borrowdale and Wythburn (1562 ft.); (2) in Westmorland, between Dungeon Gill and Fell Foot, the scene of Wordsworth's *Excursion*. The excursionists climbed Lingmoor from Little Langdale vil. and

dropped upon B. T., 'the little lowly vale' from the wild table-land of the 'savage region.'

Bleaching. All textile fibres contain substances (impurities) additional to the main ingredient (cellulose or protein) of which they are composed, and to facilitate the manuf. of these fibres into yarns and fabrics it is usually necessary to add other substances in the form of sizes containing fibre lubricants and agglutinants. When it is desired to dye, print, and finish these yarns and fabrics, it is necessary to remove these extraneous substances by a B. treatment since they would very likely adversely influence the absorption of dyes and finishing agents either because of their water-repellent nature or by reason

impurities, and it is necessary to control B. processes closely so that fibre damage is kept to a minimum—any excessive damage, especially if it is unevenly distributed, leads to uneven dyeing and localised low wear values. The emphasis to-day is on B. processes which can be of the continuous type, that is, allow yarn or fabric to enter a plant at one end and emerge at the other fully purified and whitened. This is possible with cellulose fibre materials, particularly those of cotton, but not with protein fibres such as wool and silk.

B. processes usually involve 2 stages of treatment—a hot scouring with a detergent solution with the object of removing fatty, oily, and waxy impurities by a



BLEA TARN AND THE LANGDALE PIKES

of their chemical reactivity. It has been well said that 'a well-bleached textile material is half dyed.'

Very early processes were based on the power of sunlight and exposure to weathering to disintegrate and make water-soluble the various impurities, so that these could be removed by washing. Sunlight can destroy the natural colouring matters present in most fibres. The obvious disadvantages of having to depend on sunshine, rain, dew, etc., led to the devising of B. methods based on the use of the chemicals which gradually became available towards the end of the 18th cent., e.g. acids, alkalis, soaps, B. powder, sulphur dioxide, etc. The later introduction of hydrogen peroxide as a fibre agent has proved very important.

Modern B. methods involving the use of a limited number of chemical oxidising and reducing agents, supplemented by the use of various types of detergent (q.v.), now allow the purification of all kinds of textile materials to be effected rapidly and (important) with the minimum harm to the fibres. Most of the chemicals employed are capable of impoverishing the fibres at the same time as they attack the

process of emulsification, and a subsequent oxidation or reduction treatment to destroy residual impurities and especially any colouring matters. The conditions of treatment and the chemicals used are chosen to suit the chemical nature of the fibre. It is important that cellulose fibres such as cotton and linen are not harmed by hot to boiling alkalis or by active chlorine in the form of hypochlorite or chlorite, but are readily damaged by acids, while protein fibres such as wool and silk are fairly resistant to acid treatments but readily harmed by active chlorine and by alkalis, especially when these are applied at elevated temps. Thus cellulose fibres can be satisfactorily purified by scouring with boiling dilute solutions of caustic alkalis, followed by B. with alkaline or acidified hypochlorite or chlorite solutions, while protein fibres are preferably purified by scouring at moderate temps. with neutral or very mildly alkaline soap solutions, followed by B. with mildly alkaline hydrogen peroxide solution or by exposure to sulphur dioxide. Hydrogen peroxide is a very useful and satisfactory B. agent for both cellulose and protein fibres and is much used; it

has the great advantage of leaving in the fibres no harmful residual compounds.

The introduction of artificial fibres comprising the earlier so-called rayons, including viscose and cellulose acetate fibres, and also the regenerated protein fibres, and the more recently discovered synthetic fibres such as nylon, Terylene, Orlon, dynel, etc., have necessitated the devising of new or modified B. processes. The rayons are manu. in a bleached state so that it is generally unnecessary to bleach them further, but when such fibres are present with the natural fibres in yarns and fabrics, they may have to pass through the B. treatment applied to those. Since the rayons are more sensitive to li. damage than the natural fibres, it is necessary to bleach as lightly as possible. On the other hand, some of the synthetic fibres tend to have a yellowish or brownish tint which is difficult to remove even when drastic processes are used. The production of a pure white with synthetic fibre fabrics is often made more difficult by the necessity for heat-setting these (usually at temps. around 250° C.) before wet processing—such treatment may cause increased discoloration. The purification of textile materials has been much assisted by the discovery around 1930 of the so-called synthetic detergents which have now largely displaced ordinary soap. A difficulty met with in scouring textiles with ordinary soap solutions is that if hard water is used a soap scum is formed which can be highly objectionable. The scum consists of insoluble calcium and magnesium salts formed by reaction of the hardness of the water with the sodium fatty acid salts which constitute an ordinary soap. The new synthetic detergents are mainly sulphonic acids or sulphates of fatty alcohols or aromatic compounds, and they are particularly characterised in not forming insoluble calcium and magnesium salts and thus in not giving a scum with hard water. These new detergents have the further advantage of being effective in hard water, whereas ordinary soap under such conditions becomes ineffective. There are many different synthetic detergents now available but the most widely used are those based on sulphonates of alkyl benzenes; such products are assisted in their scouring action by powerful wetting and penetrating properties.

Cotton and linen bleaching. Early B. processes were extremely tedious to carry out, being based on the use of lime as a preliminary treatment for the B. process proper which used calcium hypochlorite (B. powder), but they have now been almost completely superseded by more rapid although perhaps not more effective processes. A typical process for an all-cotton woven fabric consists of running the fabric very rapidly in open-width over a gas flame issuing from a suitably long slot to burn off fibre ends protruding through the fabric surface, and thus make this less hairy and more sheer, quenching any dangerous sparks by a run through a water-trough, running the fabric through a 1 to 2 per cent solution of caustic soda

+ sodium carbonate (a more drastic treatment results by using a higher proportion of caustic soda) and evenly packing it within a kier (a vertical steel container provided with a false bottom and in communication with a heater and with a top cover which can be fastened down watertight) so as to allow a continuous circulation of the alkaline liquor downwards through the cotton fabric to be maintained. In this kierung stage, the alkaline liquor is sprayed over the top of the fabric and is withdrawn through the false bottom, whence it passes through the heater to be raised to the boil at 100° C. or higher (under pressure) and pumped again to the spraying device. Kiering of the fabric may occupy from say 4 to 12 hrs and then the fabric may be run out of the kier through a washing machine and be returned to the kier for a further treatment with the boiling alkaline liquor, so as to complete solubilisation and emulsification of all the impurities with the exception of the natural yellow colouring matters. The fabric is withdrawn, again washed, and then impregnated with a dilute solution of sodium hypochlorite and piled in smooth tiled cisterns to lie for 1 to 2 hrs while the cotton is bleached to a pure white as the yellowing colouring matters are destroyed by oxidation. Then follows a thorough washing to remove all soluble impurities and extraneous chemicals. The fabric is at this stage ready for finishing in its white bleached state or for dyeing or printing. If the cotton fabric contains rayon or synthetic fibres then it may be desirable to avoid the kierung. In this case the fabric will be stung and run through a liquor containing a dilute solution of a starch-liquefying enzyme, such as a diastase made from malt or from fermented starch or from animal waste matter, then to be piled in cisterns to allow sufficient time for the enzyme product to solubilise most of the impurities. Then will follow a thorough washing and a hypochlorite B. If the rayon present is of the regenerated protein type adversely affected by active chlorine, then hydrogen peroxide will be used as the B. agent as for wool B. Linen fabrics are bleached similarly to those of cotton, except that it is not necessary to be so thorough. Indeed too complete a removal of the natural impurities would result in a loss of weight not commercially acceptable. Cotton and linen yarns are kiered and bleached in much the same manner as fabric, except that the methods of manipulation are appropriately modified. In all such B. it is especially important to avoid irregular oxidation of the cotton fabric or yarn; such oxidation is promoted by exposure of the cotton saturated with hot alkaline liquor to air, or by contact of the hypochlorite saturated cotton with metal such as iron or copper, and it leads to formation of patches of oxycellulose which resist dyeing with direct cotton dyes and which are a source of fabric or yarn weakness. Viscose and cellulose acetate rayon fibres are much weaker in their wet state, so that they must be handled with more care

than is necessary for cotton; they are particularly liable to damage by sheering during mangling operations.

Wool and silk bleaching. Wool is very greasy and may contain up to 50 per cent of wax and fatty impurities mixed with suint (perspiration residues). Silk as spun by the silkworm is a double thread consisting of 2 fibroline fibres cemented together by silkum (alkali-soluble sericin). Both fibres contain yellow to brown colouring matters.

Wool is brought into a purified condition by first scouring it (usually in the form of loose fibre as a preparation for spinning into yarn) with a warm mildly alkaline soap solution. If the wool contains much vegetable impurity such as twigs, leaves, etc., then it is impregnated with a 4 per cent solution of sulphuric acid, dried, baked at 100° C., and then 'willowed' or beaten to disintegrate the vegetable matters made friable by the acid baking (carbonising), so that these can be finally easily removed by washing. Since loose wool must have added to it a lubricant before spinning, it follows that yarns and fabrics must also be scoured to remove this before dyeing and finishing. Such scouring is usually effected with the aid of soap and alkali, but there is a risk of impoverishing the wool if too much alkali is used. The B. of wool to secure a good white is achieved by suspending the moist scoured yarn or fabric within chambers filled with sulphur dioxide produced by burning lumps of sulphur in one corner, or by treating the wool with a warm moderately alkaline dilute solution of hydrogen peroxide. In the latter case it is usual to pack the wool into a large container holding a 2- to 4-volume hydrogen peroxide solution stabilised with sodium silicate or an oxalate and leave it overnight; the wool is then washed. The white produced by treatment ('stoving') with sulphur dioxide is not permanent, so that the yellow colour gradually returns, but hydrogen peroxide B. yields a permanent white. Raw silk is purified from silkum and the double thread separated into single threads by a thorough boiling in a 1 per cent soap solution; the removal of the silkum involves a 25 to 30 per cent loss of weight which is sometimes made good by a subsequent weighting treatment. The silk is made white by B. it as for wool with an alkaline hydrogen peroxide solution. Both wool and silk (but not so easily wild silks) can be easily impoverished and given a harsh handle by using alkali under too drastic conditions in the scouring and B. operations.

Various materials such as jute, hemp, straw, and paper-making fibres can be purified and made white by alkaline scouring or kiering followed by treatment with hypochlorite or hydrogen peroxide solutions; the exact conditions have to be adjusted to suit the particular type of fibre.

Fluorescent whitening agents. A very important new method for whitening textile materials of all kinds has been developed by the discovery that if a substantially white or colourless substance

having the power to emit a bluish fluorescence in ultra-violet light is applied to a half-bleached or off-white yarn or fabric (this will usually be slightly yellowish), then to one observing it in daylight (this contains a sufficient proportion of ultra-violet light) the bluish fluorescence will not only mask the yellowish tint but also contribute added whiteness, so that the yarn or fabric appears much whiter than it really is. If a fully bleached and white material is similarly impregnated with the fluorescent substance, then a remarkably brilliant white is produced. Many proprietary so-called fluorescent whitening or optical B. agents of this kind are now available and they are widely used in circumstances where the use of a chemical B. agent such as a hypochlorite or hydrogen peroxide would harm the fibre; the new whitening agents have no chemical action on the fibres whatever. In the past, improvement of white materials has been obtained by application of ultramarine as a blueing agent, but this has the disadvantage of introducing a certain degree of greyness. The new whitening agents have not this defect and actually increase the whiteness as well as make it a purer white. See S. H. Higgins, *The History of Bleaching*, 1924; J. T. Marsh, *An Introduction to Textile Bleaching*, 1946; A. J. Hall, *The Standard Handbook of Textiles* (4th ed.), 1954, and *A Handbook of Textile Dyeing and Printing*, 1955.

Bleaching, cap. of the Marlborough dist. of New Zealand, situated on the Wairau R., near the coast, 20 m. S. of Picton by rail. Pop. 9210.

Bleaching Powder, rather dirty white powder made by the action of chlorine upon slightly moist slaked lime. In Bachmann's process the lime is blown to the top of a chlorinating tower by means of compressed air, and is distributed to the highest floor of the tower through a hopper. It then falls to successive lower floors, on each of which it is mechanically raked, while a current of chlorine is driven up the tower in the opposite direction. Conditions are so adjusted that by the time the product reaches the last floor it is fully chlorinated. Hot air is now blown through it to remove free chlorine, and the B. P. falls into a hopper from which it can be delivered into containers. B. P. or 'chloride of lime' is a mixture of calcium hypochlorite, $\text{Ca}(\text{OCl})_2$, with basic calcium chloride monohydrate, $\text{CaCl}_2 \cdot \text{Ca}(\text{OH})_2 \cdot \text{H}_2\text{O}$. When treated with dilute acids it yields chlorine gas. The chlorine so obtained is known as 'available chlorine.' A good commercial sample gives 36-40 per cent of its weight of chlorine. B. P. is used in bleaching (q.v.), as a disinfectant, and to destroy mustard gas. On exposure to air it gradually deteriorates.

Bleak, fresh-water fish belonging to the Cyprinidae, in which the air-bladder opens into the gullet. The common B., *Alburnus lucidus*, is a fish with a prominent jaw and an elongated body, generally from 5 to 7 in. in length. It is common in the European riva. N. of the Alps, and occurs in large shoals. It forms a great part of

the diet of such fish as the pike, trout, etc. Artificial pearls are manuf. from the coating of its scales.

Blechnum, genus of ferns of the Polypodiaceae, about 180 species, of which *B. spicant*, the Hardfern, is alone found in the N. hemisphere, including Britain. Others are grown in greenhouses.

Bleda (*d.* 445), King of the Huns, brother of Attila (q.v.). The 2 reigned together from 434 to 445, when B. was put to death.

Bleeding, discharge of blood occasioned by the rupture or cutting of arteries, veins, or capillaries. There may also be a general oozing from congested mucous surfaces, although no fissure in the walls of the vessels can be detected. Arterial B. is characterised by jerky or spurting emission and the bright scarlet colour of the fluid; in venous B. the fluid is dark red and comes in a continuous stream; capillary B. is shown by a bright red colour and a gentle flow. The methods of stopping B. for first-aid purposes involve the elevation of the wounded part, the application of cold, and pressure by fingers or bandages at suitable points. If the B. is arterial, pressure must be applied to the artery between the heart and the wound, and if the artery is some distance below the surface a tourniquet may be necessary. Venous B. is checked or stopped by pressure directly on the wound by a pad kept in position by bandages. Internal B. is best treated by keeping the patient in a recumbent position. B. as a remedial measure is seldom resorted to nowadays as compared with its continual use centuries ago. The means adopted are venesection, cupping, and leeching. *Venesection*, or the cutting of a vein, is used to relieve venous engorgement; a vein in the forearm is opened. *Cupping* means withdrawing blood by means of the reduced air pressure in a heated cup placed over a puncture in the skin. It is not now used. *Leeches* are applied over prominences where pressure can afterwards be applied to stop the B. They may either be allowed to drop off of themselves or induced to do so by the application of salt. See CUPPING; HAEMOPHILIA; LEECHES; VEN-SECTION OF PHLEBOTOMY.

Bleek, Friedrich (1793-1859), Ger. biblical critic, b. Ahrensboök, Holstein. He studied theology at Kiel and Berlin; became a tutor at the latter univ. in 1818, and prof. of theology in 1823. In 1829 he moved to Bonn, where he was also prof. of theology till his death. His chief work is his commentary on the Hebrews, one of the best exegetical works of the 19th cent. His *Introduction to the Holy Scriptures*, 1860-2, and the *Lectures on the Apocalypse*, 1875, were trans. into English.

Bleek, Wilhelm Heinrich Immanuel (1827-75), Ger. Africanist. In 1855 he went to S. Africa to study the native languages and folklore; 1856, librarian to the Governor Sir George Grey; later became interpreter to the Department of Native Affairs; 1862, Keeper of the library founded by Grey. In 1862-9 appeared

the first two parts of his main work (unfinished), *Comparative Grammar of South African Languages*. May be regarded as founder of scientific research on Bantu languages; he also studied the Hottentot and Bushman languages. His research was continued by his sister-in-law Lucy C. Lloyd (who ed. *Specimens of Bushman Folklore*, 1911) and his daughter, Dorothy B.

Blehr, Otto (1846-1926), Norwegian politician. A Liberal, he took part in the agitation for the estab. of parl. gov. in Norway. When this had been attained in 1884, he turned his attention to the question of the separation of Norway and Sweden, and, as Prime Minister, he was leader of the movement for the peaceful settlement of that issue.

Bleiberg, Austrian vil. in the prov. of Carinthia, 8 m. W. of Villach, on the N. slope of Mt Dobratsch. It has lead mines and lead-pigment works. Pop. 3000.

Bleibtreu, Georg (1828-92), Ger. painter, b. Xanten, Rhenish Prussia. Pupil of Düsseldorf Academy, 1843-8, also later under Hildebrandt. In 1858 he went to Berlin, where he made his first success with scenes from the Dan. war. In 1866 he accompanied the Prussian army in the suite of Prince Frederick Charles; 1870 in that of the crown prince; 1869 member of Berlin Academy. The works for which he was celebrated consisted of battle-scenes from the wars of Frederick the Great, the Napoleonic wars, and from other wars during his lifetime.

Blekinge, prov. of Sweden, which is washed by the Baltic Sea on the E. and S. sides. It is one of the most beautiful and historically interesting parts of Sweden. It belonged to Denmark, with the exception of 1332-60, till 1648, when it was united to Sweden. The chief tn is Karlskrona. The area of B. is 1300 sq. m. Pop. 147,000.

Bleneathra, see SADDLEBACK.

Blench Holding, see BLANCH.

Blende (Ger. *blenden*, to deceive), one of the prin. zinc ores, a zinc sulphide. In nature it occurs both crystalline and massive, and sometimes in a soft amorphous form. In its pure state the crystals are colourless and transparent, though mostly they are coloured by traces of iron or other metals. B. generally occurs as a yellow-brown or black mineral with a somewhat resinous lustre, associated with ores of lead. Alternative names of B. are sphalerite, false galena, and black jack. Other varieties are manganese-blende, ruby-blende, and antimony-blende.

Bléneau, Fr. vil. in the dept of Yonne, on the Loing. Turenne (q.v.) defeated the great Condé (q.v.) here in 1652. Pop. 1600.

Blenheim: 1. Ger. *Blindheim*, vil. of Bavaria on the l. b. of the Danube, a short distance below Höchstädt. It is remembered as being the scene of the defeat of the French and Bavarians under Tallard on 13 Aug. 1704, by the English, under the Duke of Marlborough, allied with the Austrians under Prince Eugene. The French and Bavarians lost over 30,000 killed, wounded, and prisoners,

and the Allies about 12,000. The battle is known on the Continent as the battle of Höchstädt. Pop. of B. is 970.

2. Cap. of Marlborough co., in the S. Is., New Zealand, 15 m. from Picton, its port. There are 2 airfields nearby. Pop. 7860.

Blenheim Palace, seat of the Duke of Marlborough, near Woodstock, Oxon. It was presented to Marlborough in acknowledgment of his victory at Blenheim during the reign of Queen Anne. It stands in the royal estate of Woodstock, which also formed part of the reward. The £500,000 voted for the presentation was found to be insufficient. Its architect was Sir John Vanbrugh, whose powers are amply proclaimed by the grandeur of the massive building, the length of whose front is 348 ft. The area of the park is 2700 ac., and its boundaries 12 m. long. The trees are said to be arranged on a plan similar to the placing of Marlborough's men at Blenheim. The R. Glyme widens into an artificial lake, and is spanned by a large bridge.

Blenheim Spaniel, variety of miniature spaniel much like the King Charles, but with shorter ears and different in colouring, being pure white with brown and red markings. Its name comes from the estate of the Duke of Marlborough, where it was first bred. See SPANIEL.

Blenker, Ludwig (1812-63), Amer. soldier, b. Worms. After the revolution of 1849 he fled to U.S.A., and being made a general in the Federal army he fought with distinction throughout the Civil war.

Blenkinsop, John (1783-1831), engineer, b. near Leeds. He was a forerunner of Stephenson in the development of the locomotive. His locomotive was patented in 1811, its chief feature being a cog-wheel that fitted into a toothed rail. At a test at Hunslet, Leeds, on 24 June 1812, it covered 1½ m. in 23 min., 'without the slightest accident.'

Blennerhassett, Harman (1765-1831), Irish-American, lawyer, b. Hants, England, where his mother was staying temporarily; educ. at Trinity College, Dublin, and called to the Irish Bar, 1790; he married his niece, and ostracised for this went to America, where he bought an is., since called B. Is., in the Ohio, near W. Virginia; he supported Aaron Burr in his conspiracy, and his is. was plundered by the W. Virginia militia; he went to Canada later, where he practised as a lawyer, and returned to England in 1822, dying on Guernsey.

Blennorrhoea, excessive discharge of mucus (q.v.).

Blenny, name given to various species of percomorph of the suborder Blennioidea. They are littoral fishes found in all temperate and tropical seas in great variety; they are of small size. The B.s. are distinguished by having the pelvic fins placed before the pectoral fins, and each consists of 1 to 3 soft rays. *B. ocellaris*, butterfly blenny, is a Brit. species.

Elephantitis, inflammation of the free edges of the eyelids. B. is as a rule a chronic condition and follows infectious

diseases in children. Those who suffer from it are usually undernourished, delicate, and debilitated. The disease is characterised by the formation of crusts along the margins of the eyelids. Treatment consists in the application of penicillin ointment after first removing the crusts. Recurrences of B. are likely unless attention is paid to the general health.

Blériot, Louis (1872-1936), Fr. aviation pioneer, b. Cambrai. After unsuccessful efforts at designing biplanes in 1905, he became the brilliant pioneer of the practical monoplane, a type he started building and flying in 1907, and which culminated in the type XI in which he was the first to fly the Eng. Channel on 25 July 1909, an achievement which brought him world fame and did more than any other flight to impress the world's govs. with the vital importance of aviation. This flight brought B. many orders and caused the B. monoplane to be used the world over.

Bles, Harri met de (1480-c. 1550). Flem. artist, b. Bouvignes. He is usually identified with Harri Patenier, nephew of Joachim Patenier, whose style he imitated. He generally painted landscapes, with scriptural subjects introduced, and instead of signing his own name painted an owl in the corner. His name is understood to refer to his shock of white hair.

Blessed Virgin, Servants of the, see SERVITES.

Blessington, Marguerite, Countess of (1789-1849), Irish writer, daughter of Edmund Power, a small landowner, b. Knockbrett, Tipperary. She was compelled to marry Captain Farmer when she was only 14. His worthlessness caused her to leave him after 3 months. Not long after his death she married Charles Gardiner, Earl of Blessington, in 1818. In 1822 she toured the Continent, and while at Genoa made the acquaintance of many distinguished men, among them Byron. This acquaintance ripened into friendship. Till 1829, the year of her husband's death, she lived in Paris, and here as in London became the leader of a world of music, art, and literature. With the fortune left her she estab. a court at Gore House, Kensington. Latterly she became bankrupt and lived under the protection of the Count d'Orsay. Her *Conversations with Byron* were pub. in 1834, and she also wrote some novels and travel books. See M. Sadleir, *Blessington-D'Orsay*, 1933.

Blessington, vil. of co. Wicklow, Rep. of Ireland. Here is Poulaphuca, an artificial lake at the confluence of the rvs. Liffey and Kings, providing Ireland's second largest hydro-electric scheme.

Bletchingley, vil. of Surrey, England, 5 m. NE. of Reigate. Fuller's earth is raised in the neighbourhood. Pop. 3000.

Bletchley, urb. dist. of Bucks, England, comprising B. Fenny Stratford (q.v.), Simpson, and Water Eaton. Pop. (1955), 12,000; is being developed by expansion from London (45 m.).

Bletting, first stage in the decomposition of ripe fruits, when *blets*, or rotten spots, first appear on them. Some fruits

such as the medlar, are kept until they reach this stage to improve their flavour.

Bleuler, Eugen (1857-1939), Swiss psychiatrist, b. Zollikon, Zürich. He studied at Zürich, Berne, and Munich, qualifying in medicine in 1883. From 1888 to 1927 he was prof. of psychiatry at Zürich. Here, with his pupils, he studied the psychological aspects of mental disorder, using both the experimental methods of Wundt and the psycho-analytical procedures and theories of Freud. In 1906 he pub. *Affektivität, Suggestibilität, Paranoia*, and in 1911 introduced the concept of schizophrenia, and showed that Kraepelin's *dementia praecox* should include all the schizophrenic disorders (*Dementia Praecox oder die Gruppe der Schizophrenien*, 1911). Later he became more and more critical of psycho-analytic theory. He also wrote on the psychopathology of hallucinations, a text-book of psychiatry (1916), and *Naturgeschichte der Seele*, 1932.

Blewfields, see BLUEFIELDS RIVER.

Blewits, edible mushrooms found in autumn. *Tricholoma personatum*, with greyish cap and thick, violet-stained stem, is a pasture species; *T. nudum*, Wood B., is a clear bluish lilac when young, cap and gills becoming somewhat reddish. See AGARICUS.

Blicher, Steen Steensen (1782-1848), Dan. novelist and poet, b. near Viborg, educ. at Copenhagen. In 1819 he became pastor at Thorning, and in 1826 at Spøndrup, Jutland. Between the years 1807-9 he trans. Ossian; and the pub. of *Snaeklokken*, 1826, and *Jyske Romanzer*, the first of his Jutland tales, earned him great popularity, which was, however, surpassed by his *National Noveller*, which admirably reflect country life of Jutland. As a poet he is essentially national, and his works are full of tenderness and philosophic thought. See J. Nørvig, *Blicher Hans Liv og Vaerker*, 1913.

Blickling, vil. of Norfolk, England, near Aylsham. It is famous for its hall, which is a fine quadrangular red-brick Jacobean house, the building of which was begun by Sir Henry Hobart, Lord Chief Justice of England, who pulled down the 14th-cent. manor-house, in which Anne Boleyn spent much of her childhood. The present hall was completed in 1626 by the son of the Chief Justice, who entertained Charles II there. The W. front was rebuilt in 1729 after a fire. B. was sold by the old knight, Sir Thomas Erpingham, to Sir John Fastolf. The whole of the village of B. belongs to the National Trust. The fine park contains a lake. B. church is a Perpendicular structure on the S. side of B. park. Pop. 270.

Blickling Homilies, so called because the MS. containing them is preserved at Blickling Hall, Norfolk, consist of 19 sermons belonging to the third quarter of the 10th cent. Their style represents a transition from the prose of Alfred to that of Aelfric. Ed. by W. Morris, 1874-80, for the Early English Text Society.

Blida, tn of Algeria 25 m. by rail from Algiers. It possesses orange groves, while other products include cotton, raisins,

grain, tobacco, and cork-wood. Earthquake visitations occurred in 1828 and 1867. Pop. 67,913, including approximately 12,000 Europeans.

Bidworth, coal-mining vil. of Notts, near Mansfield, England. Pop. 4000.

Bligh, William (1754-1817), admiral, b. of a Cornish family. His name is usually connected with the mutiny of the *Bounty*. He sailed with Cook on his second voyage as sailing master, and during this voyage bread-fruit was discovered at Tahiti; from this discovery he received his nickname Bread-fruit Bligh. After seeing some active service he was sent back in command of the *Bounty* to introduce the bread-fruit plant into the W. Indies from Tahiti. He stayed at Tahiti for some 6 months, and during that time his men became so demoralised that on sailing for the W. Indies his crew mutinied, and he and his officers were cast adrift. After a voyage of over 4000 m. in an open boat they managed to reach Timor. On his return to England in 1790 he was appointed to the *Providence*, and managed at last to carry out his original project. He was present at the mutiny at the Nore in 1797, and later fought under Duncan at Camperdown, being present also and specially mentioned at the battle of Copenhagen. In 1805 he was appointed governor of New S. Wales, but his severity led to mutiny, and for 2 years he was imprisoned. The officer who led the revolt was later brought home and cashiered. In 1811 he returned to England, and was made first a rear-admiral, and later a vice-admiral. He d. in London after a courageous but somewhat stormy career. See G. Mackaness, *Life of Vice-Admiral William Bligh*, 1936, and H. V. Evans, *Rum Rebellion*, 1938.

Blighia, genus of plants named after Adm. Wm. Bligh, R.N., family Sapindaceae. *B. sapida*, the akoo-tree, is the sole species, and is a native of Guinea. It is cultivated for its fruit, the aril of the seed is pulpy, and has a pleasant subacid flavour.

Blight, term used generally to describe some insect infestation (c.f. Aphides, q.v.) or fungus infection (e.g. Potato Blight (q.v.)) of plants, and often associated with certain kinds of weather, in which the parasites increase rapidly.

Blighty (corruption of Hindustani *belati* from the Arabic *bilādūt*, meaning a prov. or distant country), word which came into use among the Brit. troops in the First World War, signifying the home country.

Blimbing, or Bilimbi, see AVERRHOA.

Blind, Karl (1826-1907), Ger. author and revolutionary, b. Mannheim; he studied law at Heidelberg. He was sentenced to a term of imprisonment for his part in the revolution of 1848; but escaped to Belgium, and then to England, where he continued his revolutionary activities. The Schleswig-Holstein movement had its origin in B., who directed his efforts to the estab. of Ger. unity. He also pub. numerous historical works.

Blind, Mathilde (née Cohen) (1841-96), Brit. poetess; she adopted the name of her

stepfather, Karl B. (q.v.). At different periods she travelled in Switzerland, Egypt, and Italy, and it was her visits to Scotland that inspired her to write 2 long poems, *The Prophecy of St Oran*, 1881, and *The Heather on Fire*, 1886, which is a passionate outcry against the Highland evictions. In her epic, *The Ascent of Man*, 1888, she handles so vast a theme as Darwin's theory of evolution. As a writer of biography she is remembered for her *George Eliot*, 1883, and *Madame Roland*, 1886, whilst she showed her gift for trans. in her Eng. renderings of Strauss's *The Old Faith and New*, 1873-4, and *The Journal of Marie Bashkirtseff*, 1890. At her death she bequeathed her property to Newnham College, Cambridge.

Blind Landing, system of radio signalling as aid to landing of aircraft at the airport in conditions of low visibility. In 'instrument landing,' the aircraft flying at 2000 ft first obtains indication of correct direction of approach at a distance of about 25 m. by a radio range (q.v.). From about 5-10 m., the pilot is guided in the horizontal course by a set of beacons transmitting signals, each at distinctive modulation, and at the same time the aircraft begins to descend under the guidance of a vertical range system consisting of 2 aeriels, one above the other, with distinctive intensity patterns, transmitting signals of different modulations. On passing each marker beacon, a special coloured lamp flashing in the aircraft informs the pilot of his position. When the last beacon is passed, the aircraft should be a few ft above the runway. Sometimes a ground control is used as emergency. Here the pilot is instructed by radio signals from the ground, where a radar transmitter gives the controller the position of the aircraft at any instant.

Blind River, in Ontario, Canada, 70 m. E. of Sault Ste Marie, the site of largest and most important uranium development in N. America. Pop. 2054.

Blind Spot, that part of the retina or internal nervous coating of the eyeball where the optic nerve pierces through from the rear. The nerve fibres not having spread out at this point, light falling thereon conveys no impression; so that if a small object is so placed that the rays of light from it fall only upon this area it is not perceived as being in the field of vision. See EYE.

Blind-storey, in medieval architecture, an alternative name for the triforium (q.v.). It is called a B. in contradistinction to the clerestorey (q.v.), which is pierced with windows, because the triforium opens into a dark, enclosed space in the roof over the aisle.

Blind-worm, or **Slow-worm** (*Anguis fragilis*), wormlike reptile usually about 12 in. long, of which length half is tail. Internal traces of limbs indicate its relation to the lizards. Its nostrils are provided with shields, while its eyes are protected by scaly and movable eyelids. It possesses long and pointed teeth which incline backwards. The colour depends upon the age and varies a great deal accordingly, but usually the adult is

brown above and black underneath, while its young are white with a black stripe running along the centre of the back. They inhabit bushes and feed upon earthworms and slugs. Their bite is harmless. They are timid creatures, and their fright often causes a contraction of the muscles resulting in a rigidity so tense that endeavours to bend the creature often cause breakage. They hibernate during winter in groups of about a score.

Blindage, screen constructed of earth and timber, or other available materials, which soldiers build to protect themselves against the enemy's fire when they are in a trench.

Blindheim, see BLENHEIM.

Blindness and the Blind. *Blindness and causes of blindness*. The term means inability to see. B. may be congenital or acquired. When congenital, it may be due to a developmental fault in the embryo or to some pathological change during intra-uterine life caused by some toxin or deficiency in the maternal blood. Congenital cataract may be due to a deficiency of vitamin A, B, and B₂, and calcium in the maternal circulation, or to the toxin of some infective disease. Acquired B. may be due to injury or disease of any part of the chain of structures which, together, make up the visual mechanism (see EYE). Injuries may be of any kind from a direct, penetrating injury to an indirect one, such as a fractured skull involving the optic nerve. Diseases causing B. may be those of the eye itself or manifestations of some constitutional disease. Diabetes, for example, may cause B., and certain vascular accidents such as embolism of the retinal artery or thrombosis of the retinal vein may occur in association with diseases of the circulatory system. *Retrolental Fibroplasia*, a disease of the retina caused by an overdose of oxygen, was the cause of B. in over half of those registered as blind under one year old between 1951-4. In that period there were about 2000 cases. Now that the cause of the condition is known and since oxygen dosage in the newborn has been reduced, there have been practically no cases. Again, bacterial infection of the eye as part of a generalised infection may bring about pathological changes causing B., syphilis and tuberculosis being notable examples of this. Diseases causing B. that are purely ocular in origin may be divided into those due to bacterial infection and those due to some pathological change in the structures of the eye. Taking the world over, acute infective inflammations of the eye are still the commonest cause of B. in children and people of young and middle age. Of these conditions ophthalmia neonatorum (q.v.) (see also GONORRHOEA) and trachoma (q.v.) are outstanding. In this country, thanks to better living standards, ophthalmia neonatorum is seldom seen now, and trachoma never. Of the pathological diseases of the eye causing B., glaucoma (q.v.) and cataract (q.v.) are the commonest. Primary and secondary tumours of the eye do occur but they

are rare. The treatment of B. consists mainly in prevention and the treatment of those conditions which may give rise to it. As a rule, once B. has set in it is irreversible. Surgical removal of a cataract is an exception, although the sight is not often perfectly restored. Another exception is the amazing cures now achieved by the method of corneal grafting. The cornea (the transparent membrane covering the eyeball in front of the lens), scarred and thickened as a result of inflammatory diseases, injury or in some congenital condition, may be so opaque as to prevent the penetration of light to the retina, either completely or to an extent in which the patient can but barely distinguish between light and dark. This condition can now be relieved by removing the diseased cornea and grafting in its place a healthy cornea. The number of these operations was at first limited by the smallness of the number of healthy corneas available. It was discovered, however, that corneas removed within 2 to 10 hours after death and suitably stored could be used for corneal grafting, and under the Corneal Grafting Act, 1952, it is now possible for persons during their lifetime to bequeath or express a wish that their eyes may be used for this purpose after their death. The arrangements under the Act ensure that the person's wishes will be carried out with all propriety. As the bequeathed eyes have to be removed within 10 hours of death it is necessary that the procedure should be known beforehand, and it is wise to ask the family practitioner for information. One more condition causing B. must be mentioned, namely sympathetic ophthalmia. For some unknown reason severe injury to one eye is often followed after about 2 to 3 weeks by inflammatory changes leading to B. in the other, for which there is no known treatment. With these exceptions, the prin. treatment for B. must be that of social rehabilitation, and this has been recognised in the number of statutory and voluntary provisions which have been made for the care of the blind. In Dec. 1954 there were 106,260 registered blind persons in the Brit. Isles. This compares with the 25,840 registered in 1919; but the increase does not indicate an increase in the incidence of B. Indeed, the figures for B. in children of school age show a decrease from 37.0 per 100,000 in 1923 to 21.1 in 1950. This shows that B. is decreasing and not increasing. The larger number of registered blind persons to-day reflect a more efficient system of registration and a greater desire on the part of the blind to be registered.

Institutions for the blind. Before the 18th cent. there can be little doubt that no organised scientific effort for the relief of the blind ever manifested itself in the shape of responsible institutions either in this country or elsewhere. The first regularly organised estab. for the relief of the blind was the Hôpital Impérial des Quinze-Vingts in Paris, said to have been founded by St Louis in 1260 as an asylum for 300 of his soldiers who had lost their

sight in the crusades. This institution, its capacity trebled, is still in existence, but no instruction was ever imparted to its blind inmates. The first successful effort in systematic instruction was made in Paris by Valentin Haüy (1745-1822), whose disgust, it is said, was so excited by the public contumely to which the more ribald elements of the Parisian common folk subjected the pauper blind, that he set about devising means for rendering them, as a class, less helpless. Inspired by the success of the celebrated Abbé de l'Épée in the education of the deaf and dumb, Haüy believed that equally happy results could be effected for the blind, and it seems soon to have occurred to him that the most feasible method of instruction was by means of letters formed and printed in relief. The first outcome of Haüy's efforts was, in 1784, a book for the blind, and the foundation, under the patronage of the Philanthropic Society, of the Institut des Jeunes Aveugles, in Paris, organised under the immediate charge of Haüy himself. In 1786 Haüy gave an exhibition of the attainments of his 24 pupils before the king and royal family at Versailles, when the institution was placed on a more permanent footing by the royal bounty. Later, he was invited by the Russian Emperor to St Petersburg for the purpose of founding a similar institution in that city. In 1791 the School for the Indigent Blind was opened in Liverpool, its institution being due to the suggestions of a blind man named Edward Rushton. This school was speedily followed in 1793 by the Royal Blind Asylum in Edinburgh. After that the estab. of institutions for the blind occurs at intervals averaging no more than 2 or 3 years all over the U.K. up to 1879. The majority of them, however, are regarded primarily as asylums and not as educational estabs. at all. There has been a similar progress in the U.S.A., but on a more scientific scale, for in that country every state in the Union has long since made some provision for the education of its blind. In 1869 was founded in England the Brit. and Foreign Blind Association, since 1914 known as the National Institute for the Blind, to which body and, in a lesser degree, to the Royal Normal College of Music, Norwood, and the Worcester College for the blind sons of gentlemen, were due the improvement in the methods of education of the blind.

In Great Britain there are numerous resident schools and 65 special workshops for the blind. In addition there are many home teaching societies who send teachers to visit the blind in their homes and lend embossed books. The National Lending Library, founded in 1882, holds now nearly 150,000 vols. in Braille and Moon types. There are also 36 pension societies, chief among which are the Royal Blind Pension Society, Society for Granting Annuities to the Poor Adult Blind, National Blind Relief Society, Clothworkers' and Cordwainers' Companies, Hetherington's Charity, and others, while the Gardner Trust administers the income

of a bequest of £300,000 left by Henry Gardner in 1879 for the relief of the blind.

The State and the blind—The Blind Persons Act, 1920. Relations between the State and the blind, indicative of practical sympathy, are of recent development. There is no example of state monopolies being granted to the blind, but in Germany an act of 1923 made compulsory the employment of a small percentage of disabled men, including the blind, among normal workers. In France, also, a Compulsory Employment Act was passed in 1924, but only those blind persons who lost their sight in the First World War can claim benefit under it. Here and there, too, in Europe, where there are state monopolies in handling tobacco or matches, a preference in the matter of employment has been granted to the disabled, including the blind. England goes no further than an official recommendation to gov. depts and local authorities to give preference to goods produced by workshops for the blind. The First World War, however, gave a real impetus to the movement for the emancipation of the blind, and legislation which had been for years accorded only half-hearted support was speeded up. Generally speaking, however, the countries which emerge best out of the test of state responsibility for the blind are the Eng.-speaking countries. In many states of the U.S.A. state commissions, for the welfare of the blind have been estab. and many states grant pensions to blind persons as such. In Great Britain limited state pensions are paid, while many local services are insisted upon by the State and supported by public funds. Much of this activity may have had its beginnings before the war, but they were stimulated by the return of the blinded men from the fighting forces.

The Eng. Act of 1920 was the first attempt to provide nationally and comprehensively for all sections of the blind community. The Act falls into 2 parts. The first makes provision for pensions for practically all blind persons over 50 years of age; subject to inability to perform any work for which eyesight is needed the blind were by this Act entitled to pension at the age of 50 on the same scale, according to means, as those to other 'non-contributory' persons at the age of 70 under the Old Age Pensions Acts 1908-1924 (Consolidated Act, 1936). The second part of the Act requires local authorities to make schemes, to be paid for jointly out of national and local funds, for the estab. of homes, hostels, and workshops, the payment of allowances to the unemployable blind, and the organisation of home teaching and home workers' schemes. Generally speaking, the local authorities have operated their schemes in conjunction with voluntary agencies because the latter possess both specialised knowledge and the available voluntary services required. It may be noted that the Act, while it compels local authorities to submit schemes which they will be prepared to carry out, does not compel adherence to any particular

method, but leaves the adequacy of the scheme very largely for local decision. The Act also provides for the registration of the blind persons themselves and of voluntary charities operating on behalf of the blind—the object of the latter being to give some guarantee of bona fides in the interests of the blind. By the Blind Persons Act, 1933, the pension age was lowered from 50 to 40—thus directly benefiting some 7000 blind persons between the ages 40 and 50 in England and Wales alone—and, further, blind persons (and their dependants) were, apart from exceptional needs, removed entirely from the Poor Law (now abolished by the post-war social insurance legislation) by statutory provision which brought all local authorities on the footing of those who had already exercised their option (under the Local Government Act, 1909) by declaring their obligation to assist blind persons, in their administrative schemes, exclusively under the Act of 1920. The Ministry of Health has also appointed a standing advisory committee on B., including its prevention, to carry on the work hitherto undertaken by the special committee of the Union of Counties Associations for the Blind, which therefore ceased to exist in 1938.

Education and training of the blind. The blind can best be assisted by placing them as early as possible in the most favourable circumstances to help themselves. It is uneconomical not to give the blind the best education of its kind in the trade or profession they can best follow. It is an outworn fallacy to suppose that by a sort of law of compensation the other senses of the blind are keener than those of the seeing. The senses of hearing and touch must be developed before they can be any real substitute for sight, and the earlier such development is begun, the better for the future welfare of the blind person. The spirit of the times has for the last 60 years been opposed to the purely charitable as against the economic treatment of the blind, and to the idea of increasing the size of blind asylums and thereby making ever larger demands on the public funds. For those blind who for various reasons can never maintain themselves fully—and very few who have become blind late in life can ever do so—there will always be room for charity; but it is now recognised that most of the young blind ought to receive such an education as will fit them to become useful members of society. England, however, lagged far behind America and other countries in the practical recognition of this economic truth. An efficient system of education for the blind must be founded on an adequate course of physical development. With care the blind children can soon adapt themselves without undue risk to a number of the modes of recreation of sighted children, e.g. swimming, jumping, swings, skittle-alleys, roller-skating, skipping, rowing, and so forth. A sound school curriculum should provide for classes graded to meet the requirements of various ages. When the blind child

is about 14 years of age some opinion can be formed as to whether his aptitude lies in the direction of mechanical work or handicrafts, or whether he has ability in the direction of general business or even something higher. Experience shows that the chief vocations of the blind comprise organists, teachers of music (America chiefly), organ and piano tuners, basket-working, making of brushes and brooms, the making of new and remaking of old bedding, mat-making, cork-fender making, chair-caning, mattress-making, wire-making, and various forms of plaiting, of making of stereotype plates for printing Braille, telephone operating, and, more especially for women, knitting, sewing, crocheting, and the making of fancy baskets and brushes. Massage has been found very suitable work for the blind, and an Institute of Massage by the Blind was formed in London. Blind persons have also been known to follow successfully such professions as the Church and the law. The opening up of a musical education as a field for the blind has in some countries, notably in America, been attended with great success. The prejudice in England up to 1869 against the dotted system of reading instruction for the blind, a system peculiarly favourable for musical notation, may explain England's backwardness in this respect. However, the introduction into this country of the Braille system (see below), resulted in the estab. in 1872 at Norwood of the Royal Normal College and Academy of Music for the Blind. The college embraces 3 distinct depts: (1) General education; (2) Science and practice of music; and (3) Pianoforte tuning. Special care is bestowed on the intellectual training of the pupils, experience having proved that whatever the talent of the blind pupil for music, he will only become self-supporting where his musical training has had an adequate foundation in general education. All branches of musical instruction are given, and special attention is paid to the art of teaching. In the pianoforte tuning dept, pupils are trained who have passed the age at which they might have become qualified for profitable employment in other depts. A prolonged course of careful training is, however, as necessary in this dept as in the purely musical to enable the pupil to become self-supporting. In France blind organists, tuners, and teachers are trained by the Institut National des Jeunes Aveugles, and many become independent men, exercising highly lucrative professions. In the U.S.A. large numbers of blind persons become scholars and musicians. It is recognised in that country, however, that whether in the training of the blind for a musical or any other professional career, or for competition in the labour world, first-rate masters, appliances, and institutions are required, and as liberal an education as that provided by the state for sighted people. In most countries the cost of the education of the blind is met, either partially or wholly, by the State, some local authority, or a voluntary association. In regard to schools

generally, it is conceded that boarding schools are more to be desired than day schools, home influence being prejudicial from the point of view of education; for the blind child is generally treated at home differently from the sighted children; a similar objection applies to the mingling in one class of blind and sighted children the result often being that the memory of the blind child is developed at the expense of its other faculties. The habit of uniting the blind with the deaf and dumb is also unsound policy. Recreation and healthful surroundings are a *sine qua non*, but more especially in the case of those blind children whose vitality, whether congenitally or for other reasons, is lower than that of the average child.

Types and appliances. The idea of enabling the blind to read by touch is an old one, which would naturally suggest itself to all who desired to assist them in the attainment of knowledge. The first attempts at its practical application were made as far back as the 16th cent., but were not very successful. The pioneer in the art of stamping characters on paper in relief was Haly, who, in printing his first book in 1784, used the Italic form of the Rom. letter. In 1832 Sir Charles Lowther, obtaining some types of this kind from France, printed some parts of the Bible with his own hand. The use of the Rom. character, however, is attended with certain disadvantages, and a long controversy between its advocates and those of Fry's type, stenographic, and point systems, has resulted in the abandonment of the Rom. characters in favour either of purely arbitrary signs or of signs which in certain cases retain the crude forms of Rom. capitals. For one thing the Rom. characters were not sufficiently distinct to the touch to be easily legible by its aid alone. Hence, in 1834, Gall, of Edinburgh, introduced a new character founded upon the ordinary Rom. capitals, but with angles in lieu of curves. Alston, of Glasgow, the Rev. W. Taylor, and others, especially in America, invented and employed other modifications of the Rom. letters; but all of them, including Dr Howe's use of small Eng. letters without capitals and with angles for curves, are open to the same objection. They do not fulfil to the finger the promise they make to the eye. It is only with difficulty that they are mastered by those who become blind in middle life. Doubtless a few of the blind, chiefly among those congenitally blind or blind from early childhood, have developed an extraordinary sensibility of touch: but acuteness of touch is not natural to the blind, and can only be developed by practice, and is not to be cultivated in a high degree except by those who, being exempt from necessity for manual labour, can keep the skin of the finger tips in a condition of softness and delicacy. But even when allowance is made for increased delicacy of touch, it may still be taken as a fact that the Rom. character, in all its modifications, is read by the blind with difficulty, and the experience of Amer. states schools was a proof of this. According to ann. reports

furnished to the states legislatures in 1868, among the pupils at those schools where a Rom. letter was used, and after 5 years' instruction, one-third read fluently, one-third imperfectly, spelling the words letter by letter, and one-third failed entirely. At the Missouri Institution, on the other hand, where Braille's dotted character was employed, two-thirds of the pupils could read fluently, and one-third imperfectly, while no failures were recorded. As regards Eng. practice, Dr Fry's alphabet of ordinary capitals without their small strokes, invented in 1832, and Taylor's and Alston's

from those which they are made to represent by Frere. His method has the recommendation of being easy to acquire; but the books are bulky, which makes reading a slow process, and renders the cost of production very great. In Frere's system the lines are read alternately from left to right and from right to left, the finger on reaching the end of the first line traversing a vertical arc to the right end or beginning of the next line, the letters of which are all reversed. Moon borrowed the reversal of the alternate line from Frere, but did not reverse the letters themselves. Moon's type is still used by

A	B	C	D	E	F	G	H	I	J
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
K	L	M	N	O	P	Q	R	S	T
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
U	V	X	Y	Z	and	for	of	the	with
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
ch	gh	sh	th	wh	ed	er	ou	ow	W
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
									will
									⠠
									⠠
									⠠

BRAILLE DOTTED SYSTEM

books in Fry's type in 1836, were the last works in Roman. From 1838 onwards arbitrary signs came into use. Some of these are frankly shorthand—phonetic or stenographic. Others consist of rudimentary Rom. characters, or combinations of mere symbols and rudimentary Rom. capitals. The Lucas type is based upon ordinary shorthand, the signs representing the letters of the alphabet, contractions being used wherever possible. In the Frere phonetic system the signs represent vocal sounds. Both systems rendered the books printed in them cheaper and less bulky than those in which common type was used, but they presented difficulties to the uneduc. adult blind. Dr Moon, himself a blind man, devised in 1847 a system in which many of the Rom. letters are retained in simplified or rudimentary forms, while those which are more complicated are replaced by Frere's simple linear signs, any infringement of the latter's system being avoided by making the purely arbitrary signs selected represent different letters

home teaching societies, being, from its simplicity, more adapted to the requirements of the dull or uneduc. than that which is known as the point system, and being also more easily learnt than Braille by people who have lost their sight late in life. But practically all the other 'line' types have disappeared before the advance of the 'point' or dotted system. In the transition period, however, there was much confusion, any blind person, who had painfully acquired the power of reading one system, having to repeat his labour in order to master another, so as to be able to buy the very limited literature in embossed type on the market. In 1869, however, was formed the Brit. and Foreign Blind Association, which included among its members men of the highest ability and social standing. Five of the 6 gentlemen who at that time formed the executive council were totally blind, and the sixth was partially so. All 6 were able to read by touch at least 3 systems, and were pledged to, or peculiarly interested in, none. The

association, after extensive and persevering inquiries, came to the conclusion that the system which best met the requirements of the blind was the dotted system of M. Braille. That was introduced into the Institut des Jeunes Aveugles in 1834, and steadily grew in favour until there was scarcely a country in the civilised world in which it was not widely known and used, while at the same time a prejudiced opposition brought it about that it was scarcely heard of in the U.K. until 1869. The Braille dotted system, the introduction of which into this country was promoted by Dr Arnytage, of the Brit. and Foreign Blind Association, was invented by Louis Braille, pupil, and afterwards a prof., of the Institut National des Jeunes Aveugles, Paris. The basis or root form of Braille's character is furnished by 6 dots arranged in 3 horizontal pairs: $\cdot\cdot$, and every letter of the alphabet is represented by the omission of something from this root form. The omissions are regulated on the most simple system. For all the first 10 letters, the 2 lower dots are omitted altogether, each letter being formed by the 2 upper pairs or by some further omissions from them. The next 10 letters are formed by adding the left-hand dot of the lower pair to the former combinations, e.g. B is represented by $\cdot\cdot$ L by $\cdot\cdot$ C by $\cdot\cdot$ and M by $\cdot\cdot$ and so on. The remaining letters require both dots of the lower pair. The simpler forms when standing alone represent stops, and when following a particular prefix, figures. In all there are 63 possible combinations. The same system is applied to music, and the introduction into this country of a good system of embossed musical notation lessened the difference previously existing between the prospects of blind musical pupils in this country and those of America or France. In America there were at least 2 modifications of the point type, viz. the New York point and Amer. Braille, in which the most frequently recurring letters, e.g. E, S, T, A, were represented by the least number of dots. But experiments carried out between 1905 and 1915, resulted in a modified form of Brit. Braille being adopted in the U.S.A. in 1918. This modern Amer. Braille is known as Grade 14, whereas the form of Braille used in all other Eng.-speaking countries is Grade 11. For working by Braille a simple frame with a plate of zinc or other metal has been perfected. The paper is kept in position over the plate by strips of other metal, and the worker with his stylus makes the necessary indentations in the paper through the perforations in the securing bands of metal, which, besides holding the paper firm, guide the writer's hand. When a line is completed the bands are placed lower, and the writer proceeds as before. F. Hall, the superintendent of the Jacksonville School for the Blind, brought out a Braille typewriter, and also a stereotype platemaker, which can be operated by blind workers, and by which thin copper plates can be embossed and the requisite number of copies printed. An automatic Braille typewriter was

brought out in Germany, while Wayne, of Birmingham, constructed a cheaper Braille writer. In addition to these and kindred inventions, many boards have been made to facilitate the working out by the blind of arithmetical problems, one of the best being that introduced by the Rev. W. Taylor, containing a number of star-shaped holes, into which the student can fit a square pin in 8 different positions. The board is effective also for algebra. A newspaper in Braille, the *Braille News Summary*, is pub. weekly by the National Institute for the Blind.

Many men, both sailors and soldiers, lost their sight during the First World War, and organisations to provide for their welfare were estab. in most of the countries concerned. This work was naturally continued after the Second World War. One of the earliest was the English one of St Dunstan's, founded by Sir Arthur Pearson, an institution which undertook with great success the training and care of men and women blinded on war service.

Some notable blind persons. John, King of Bohemia, who d. fighting valiantly; Ziska, the one-eyed, who lost his remaining eye in battle, but continued to fight for Bohemia; Scapinelli, the blind philologist, and one of the most accomplished scholars of his day; Count de Pagan, who studied fortification and geometry; Dr Nicholas Saunderson, lecturer on optics, and prof. of mathematics in Cambridge Univ.; Sir John Fielding, half-brother of the novelist, and chief magistrate of Bow Street police court; Huber, an eminent naturalist and inventor of glass beehives; James Holman, who is said to have travelled without an attendant through a large portion of Europe, penetrated 5000 m. into Russian dominions, performed a voyage round the world, and actually on one occasion saved the ship by taking the helm; John Milton, the poet; Dr William Moon, inventor of the Moon type; Henry Fawcett, prof. of political economy at Cambridge Univ. and postmaster-general; Louis Braille, inventor of the Braille type; the Rev. Geo. Matheson, preacher and writer of the Church of Scotland; Prescott, the Amer. historian; Alexandre Rodenbach, Belgian statesman; Leonhard Euler, astronomer; Sir Arthur Pearson, founder of St Dunstan's Home for Blinded Soldiers; Sir Ian Fraser, M.P., barrister and chairman of St Dunstan's; and Helen Keller, the Amer. blind deaf-mute, who pub. 5 books and was made LL.D. of Glasgow in 1933.

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Blinn, Holbrook (1872-1927), Amer.

actor and playwright, b. San Francisco. Educ. at Stanford Univ.; appeared first in *The New South* at San Francisco and New York. Afterwards formed his own company in his native tn. Later he took his company to London, playing in *The Cat* and *the Cherub*. He achieved his greatest success as Pancho Lopez in *The Bad Man*, which toured for 3 years in U.S.A.

Bloch, Ivan Stanislavovich, see BLOCH, JEAN DE.

Bliss, Sir Arthur (1891-), composer, b. London, and educ. at Cambridge, where he studied under Charles Wood; he also studied at the Royal College of Music under Stanford and Vaughan Williams. He began by making daring experiments in unusual musical media, as in a *Rhapsody* for 2 voices singing without words and 8 instruments or *Rond* for soprano and chamber orchestra, the words of which are meaningless syllables chosen merely for their sound-values (both 1919). The latter was performed at the Salzburg International Festival in 1922. The *Colour Symphony*, produced at the Gloucester Festival the same year was for a normal orchestra, but had a novel programme in that each movement suggested a different colour and its ideological associations. But later B. settled down to work that relied on musical quality rather than sensation. Among his most important compositions are the opera *The Olympians* to a libretto by J. B. Priestley, 1949, the ballets *Checkmate*, 1937, *Miracle in the Gorbals*, 1944, and *Adam Zero*, 1946, incidental and film music, choral works to poetic anthologies (*Pastoral*, 1928, and *Morning Heroes* (Norwich Festival), 1930, the latter with an orator), *Music for Strings*, 1935, 3 concertos, 2 string Quartets, Quintets for clarinet and for oboe and strings, etc. B. was appointed prof. of music at the Univ. of California in 1940, but returned to England and was musical director of the B.B.C. in 1942-4. He was knighted in 1950 and became Master of the Queen's Music in 1953 in succession to Sir Arnold Bax.

Bliss, Tasker Howard (1853-1930). Amer. general and diplomatist. Prof. of military science, U.S. Naval War College, 1885-8; military attaché, Madrid, 1897-1898. Served in the Puerto Rican campaign in 1898, and proved himself an able administrator in Cuban affairs after the Hispano-Amer. war of 1898. Appointed to the Army War College Board in 1902, and, in that year negotiated the treaty of reciprocity with Cuba. In 1904-5, and again in 1915, was on the Joint Army and Navy Board. Held commands in the Philippines, 1908; assistant chief of staff in 1909. Commanded the Provisional Brigade on the Mexican border during the Mexican insurrection, 1911. From Sept. 1917 to May 1918 he was chief of the general staff in Washington. He represented the U.S.A. on the Supreme War Council in 1918, and was chosen as one of the 5 Amer. delegates to the Inter-Allied Peace Conference, in Paris, 1919. See F. Palmer, *Bliss, Peacemaker: the*

Life and Letters of General Tasker Howard Bliss (New York), 1934.

Blister, vesicle or bladder formed by the exudation of serous fluid between the epidermis and true skin, the result of a burn, friction, as in rowing, or the rubbing of an ill-fitting boot, and some diseases.

Blister-beetle, see CANTHARIDAE.

Blizzard, type of storm characterised by an icy biting wind and fine snow. The suddenness of its commencement and the rapidity of the consequent fall of temp., together with the blinding snow, make a B. anticipated with dread by all who have once experienced it. Probably the most disastrous B. recorded is that of 1888, which was experienced in Dakota, Kansas, and Texas. So unexpected was its attack that field labourers died on their way to shelter, quite as many from suffocation caused by the stifling snow as from the intense cold. Nearly 250 persons perished on that occasion. During the severity of the cold the R. Colorado was frozen to a thickness of 1 ft. B.s are often caused by the climatic conditions following the passage of cyclones across the E. Amer. states, and are of frequent occurrence in polar regions. The term is probably onomatopoeic, owing its origin to the noise occasioned by the violence of the wind. See METEOROLOGY.

Bloch, Ernest (1880-), Swiss musical composer, b. Geneva, of Jewish parentage; studied first under Jacques-Dalcroze (q.v.), and later in Brussels under Ysaÿe (q.v.), and at Frankfurt under Iwan Knorr. His opera *Macbeth* (1903) was produced at the Paris Opéra-Comique in 1910. It was regarded by some critics as revolutionary. In 1910 he conducted orchestral concerts in Switzerland, and produced his first symphony. In 1913 he settled in New York as teacher at the David Mannes School of Music, and in 1920 was made head of the newly estab. Cleveland Institute of Music. After a brief return to Switzerland in 1930, he returned to live in retirement in America. B. maintains a striking individuality among modern composers. His music is highly polychromatic, sometimes barbarous, and touched with a tragic passion of its own that is often distinctively Jewish. His works include a *Sacred Service* for the synagogue, 1933, sev. large-scale orchestral works, the Heb. rhapsody *Schelomo* for cello and orchestra, 1916, a *Concerto grosso* for piano and strings, 1925, a violin Concerto, 1938, 3 string Quartets, a Quintet for strings and piano, etc.

Bloch, Jean de, or **Bloch, Ivan Stanislavovich** (1836-1902), Polish financier, philanthropist, and writer on economics. Of humble Jewish parentage, he was educ. at the Industrial High School in Warsaw, and eventually made a fortune from his control of the railway system from the Black Sea to the Baltic. He promoted an industrial movement in Poland, becoming head of the timber and sugar trades. His book on the Russian railroads appeared in 1875, and his *Influence of Railways on the Economic Condition of Russia* in 1878. He was also a propagandist on behalf of the Jews in

Europe, and gained a reputation as writer more particularly by his book, *Is War now Impossible?*, 1898 (Eng. trans., 1899). His advocacy of universal peace was not without its influence on The Hague Convention of 1899. His pamphlet, *Lord Roberts's Campaign and its Consequences*, suggested the blockhouse scheme by which the S. African war was finally won. B. also furthered a number of scientific and philanthropic enterprises.

Bloch, Jean Richard (1884-1947), Fr. novelist and dramatist, b. Paris of Jewish parentage. His first novel *Lévy* was pub. in 1912, but he estab. his reputation with his second novel on a Jewish theme, called *Et compagne*, trans. *And Co.* (1918). Other novels are *La Nuit kurde*, trans. *A Night in Kurdistan*, 1925, *Les Chasses de Renau*, 1927, and *Sybilla*, 1932. His play, *Le Dernier Empereur*, 1926, was performed in both Paris and Berlin, and was followed by *Offrande à la musique*, 1928, and *Naissance d'une culture*, 1938. He also wrote sev. vols. of essays, and 2 books of travel: *Sur un carao*, 1924, and *Acacouettes et bananes*, 1927. An ardent communist, B. took refuge in Russia in 1940.

Bloch, Karl Henrik (Heinrich) (1834-1890), Dan. painter, b. Copenhagen. He studied at Copenhagen Academy, went to Italy, 1852-65, gaining a scholarship for Rome, 1859. He first won a reputation for nature studies, especially those drawn from Jutland and Zealand, but took to the humorous and anecdotal painting, too common in his day, and to over-ambitious themes like his 'Prometheus.' There are 2 frescoes by him in Copenhagen Univ. See Muther, *History of Modern Painting*, 1895-6.

Bloch, Marcus Eliezer (c. 1723-99), Ger. ichthyologist, by profession a physician. His *Allgemeine Naturgeschichte der Fische*, 1782-95, is the earliest standard work on ichthyology. Although he followed the arrangement of Linnaeus, he estab. 19 new genera and 176 fresh species.

Blochmann, Henry Ferdinand (1838-1878), orientalist, studied E. languages at Leipzig and Paris. Enlisting as a private in the Brit. Army in order to have opportunities of living in India to study the languages *in situ*, he later secured the assistant professorship of Arabic and Persian at the Calcutta Madrasa. B. passed most of his life at the Madrasa, where he became principal. His prin. writings are his detailed *Contributions to the History and Geography of Bengal* and his faithful trans. of the *Ain-i-Akbari* of Abul-Fazl (first vol. only), the notes of which give a picture of the Emperor Akbar and his court.

Bloch, Alexander, see BLOK.

Block, Maurice (1816-1901), Fr. statistician, b. in Berlin, of Jewish descent. He was naturalized at Paris after the completion of his studies at Bonn and Giessen. He entered the Fr. ministry of agriculture in 1844; in 1852 he was appointed a member of the statistical office. After his retirement from office in 1862 he devoted himself to the compilation of

statistics. In 1880 he was elected a member of the Académie des Sciences Morales et Politiques. Among his works are *Dictionnaire de l'administration française*, 1856, *Statistique de la France*, 1860, *Dictionnaire générale de la politique*, 1862, *L'Europe politique et sociale*, 1869, and *Annuaire de l'économie politique et de la statistique* (ed. by B. from 1856).

Block-books. Xylography, or printing from engraved wooden blocks, is said to have been practised in China 5 cents. before it was known in Europe. Early in the 15th cent. many books, mostly religious, were printed in the Netherlands and in Germany by this process. As a rule each page was mainly occupied by an illustration, with a few explanatory words appended, but sometimes whole pages of text were engraved. It is not certainly known whether the books were printed by rubbing the back of the paper, when placed on the block, or whether a primitive type of press was used. One side only of the paper was printed on, and 2 blank sides were then pasted together. Hard wood was generally used, but before Gutenberg's time copper also had come into vogue. One of the best-known series of B. was the *Biblia Pauperum* (q.v.). About 1428 Laurens Coster of Haarlem printed an ed. of the *Speculum Humanae Salvationis*, each page half picture, half text; the excellence of the latter (cut of course in reverse) is remarkable. See WOODCUTS.

Block-buster, popular name for 12,000-lb. bomb used by the R.A.F. in the Second World War, and so named because it was an obliteration bomb which caused whole blocks of buildings to disintegrate. Like the earlier 1000-pounders, it was constructed on the principle that a large bomb could be made much more destructive with a thin casing and a heavy weight of explosives, relying on the effect of blast rather than that of fragmentation. The first B.s used were those dropped on the Limoges factory where the Germans were making tanks, and production at the factory ceased immediately. After that they were carried repeatedly by Lancaster aircraft; thus the Kembs dam on the Rhine was breached by delayed-action B.s on 7 Oct. 1944, and on 12 Nov. of the same year the 45,000-ton Ger. battleship *Tirpitz* was sunk in Tromsø Fiord by B.s.

Block Island, is. in the Atlantic Ocean, 9 m. off the S. coast of the state of Rhode Is., U.S.A., forming part of the co. of Newport. Its greatest length from N. to S. is 7 m., and its width $1\frac{1}{2}$ m. On its W. coast stands New Shoreham, a popular summer resort. The light on the SE. coast can be seen for over 20 m.

Block System, see RAILWAYS.

Blockade, term used in both military and maritime warfare. In military warfare it meant an operation used in the place of a siege or bombardment, and consisted of an attempt to cut off a hostile tn from all outside communications and supplies. In the military sense, therefore, a B. consisted in the possession by a military force of all means of entrance into and exit from the tn. The examples

of the B. of Paris and of Metz in the Franco-Prussian war of 1870-1 may be mentioned, although the former after being blockaded also underwent bombardment. Naval B., which is usually meant nowadays when reference is made to B., is different in many essentials from military B. Originally naval B. must have been the equivalent of military B., that is, a port which was blockaded was as effectually cut off as a town surrounded by a military B., and even in more modern times a naval B. was often only the naval supplement to a land siege. But quickly a differentiation must have grown up between naval and military B., since obviously it would be an open act of war for a neutral to attempt to cross the lines of a blockading army, whereas a neutral ship might attempt to enter a blockaded port with no knowledge that a B. was taking place and in the best of faith. So in the course of time the rights of neutrals came to be recognised, and notice was given to neutral powers of the state of B. But this in itself led to abuse: a power would notify a certain port as in a state of B. before the actual B. had taken place, and this ridiculous system reached its highest point in the huge paper B. of Napoleon's continental system and Great Britain's reply in the Orders in Council. The futility of the continental system, which forbade France or France's allies to have communication with Britain, was obvious in that Napoleon himself was dependent upon Britain for a great part of his supplies. America, as the neutral nation which really suffered most, protested strongly against this system. In the early part of the 19th cent. Great Britain and the U.S.A. asserted that in order that a B. should be binding it should also be effective, and in 1856 by the Declaration of Paris it was declared that 'B.s in order to be binding must be effective, that is to say, maintained by a force sufficient really to prevent access to the coast of an enemy.' The law as applied to the position of neutral vessels is, that neutral vessels are entitled to notification before they can be seized for violation of the B.; that this notification may be made by one of the blockading vessels, by proclamation or by notoriety. It is, however, usually recognised also that if a vessel shall have had notice in any way and attempts to violate the B., she is a good prize, but if such notice is not formal but arises from notoriety, then the rule shall be as leniently construed as possible. Amongst the subjects dealt with at The Hague Conference in 1908-9 was B., and a number of rules dealing with this subject were formulated.

Blockade in the First World War. Germany, far from being a self-supporting country, depended upon overseas imports for adequate food and clothing and, to a certain extent, munitions of war. Her problem during the First World War was to obtain these supplies while the seas were controlled by the Brit. Navy, and while on land her ter. was partly closed by hostile countries. She was fortunate, however, in having neutral

neighbours who were the cause of most of the work entailed in carrying on the economic war against her. This economic war did not conform to the estab. idea of a B., in that it was not a cordon of ships placed round the coast so much as a denial of the use of the sea anywhere as a route for supplies. The only way to raise this B. was to defeat the Brit. Navy and thereby ensure safe conduct for supplies, and Germany failed to achieve this object. In considering the question of B., the changed status of the civil pop. in a modern major war must be taken into account, together with the progress in transport. Before the First World War the civil pop. and the armed forces at war were two distinct entities, the life of the former having little bearing upon the efficiency of the latter. But during the First World War (and subsequent wars) the greater number of civilians were either directly or indirectly serving a military arm or supplying the needs of those who were thus engaged, so that one purpose of maintaining the civil pop. at home was to ensure the maintenance of the armies in the field. At the opening of the war only the ineffective terms of the Declaration of London (1909) were applied to contraband, and Germany was therefore able to obtain adequate supplies through Scandinavia and Denmark. In this connection Germany was favourably situated, for supplies from Denmark were not liable to seizure by the allied fleets and those from Scandinavia could be transported in safety via the Baltic. The inadequacy of the terms of the Declaration of London was soon apparent, but it was not until Mar. 1915 that more restrictive measures were applied. This took the form of a general B., under which, in the terms of the 'Reciprocals Order,' no merchant vessel which sailed from her port of departure after 1 Mar. 1915 was allowed to proceed to a Ger. port, or if she sailed from a Ger. port after that date she was not allowed to proceed on her voyage; and after that date any merchant vessel which had goods intended for the enemy, or were enemy property, were required to discharge them at an allied port. This order also abolished the distinctions 'absolute' and 'conditional' contraband. The test now was the destination or the origin of the goods. Strictly speaking, this was not a B. According to the Declaration of London 'a blockade must not extend beyond the ports and coasts belonging to or occupied by the enemy' (Article 1) and 'the blockading force must not bar access to neutral ports or coasts' (Article 18). This action of the Brit. Gov. roused Amer. opposition, but Grey replied that no principle of international law had been violated by applying a B. in the only way in which it could be effective in cutting off the enemy's commerce with foreign countries through neutral ports. Eventually, on 7 July 1916, by an Order in Council, the Brit. Gov. informed neutral countries that as the conditions of war had changed from those which obtained when the Declaration of London was drawn up the declaration would be

withdrawn and its provisions disregarded in the economic war against Germany.

As the economic war proceeded new problems constantly arose, so that it was found necessary to set up a separate ministry, and in Feb. 1916 a ministry of B. was created, with Lord Robert Cecil (subsequently Lord Chelwood) as minister with a seat in the Cabinet. One of the first acts of the new ministry was to limit imports to neutral countries to their pre-war proportions, thus ensuring, to some extent, that they were not transferred to Germany. The ministry of B. came to an end in June 1919.

Germany's effort to defeat the stranglehold of the Brit. Navy did not begin seriously until her submarine campaign in Oct. 1914, which met at first with a fair measure of success. Von Spee's annihilation of Cradock's squadron off Coronel in Nov. 1914 lent them additional encouragement. In these successes they saw a possibility of the trade routes being once more open to them, and the slur on their navy, which the existence of a B. implied, removed. But a month later their hopes had a serious setback when Adm. Sturdee destroyed Von Spee's fleet off the Falkland Is. (q.v.). This action deprived Germany of all naval power outside her own waters, and the possibility of regaining overseas trade vanished. In spite of the vigilance of the Brit. fleet, the Ger. raider *Moewe* ran the gauntlet in Jan. 1916 and laid mines to the W. of the Orkneys, which caused the loss of a Brit. battleship. Another raider, the *Greif*, came out, but was sunk. The *Moewe* got safely back to port, after doing considerable damage. Later in the year she took to sea again, and another raider, the *Wolf*, was also successful in getting out. The submarine *Deutschland* also made successful trading trips to America, and *U 33* crossed the Atlantic and did considerable damage to merchantmen. These were, however, but isolated successes, and on 1 Feb. 1917 Germany began her 'unrestricted submarine warfare,' by which it was hoped to ruin England's food supply. This misconceived action of sinking vessels without notice helped to range the U.S.A. on the side of the Entente owing to numerous casualties among Amer. citizens, and, indirectly, Germany's answer to the B. eventually brought about her defeat on the W. front. With the U.S.A. in the war against her, Germany's hope of regaining control of the trade routes or of removing the economic pressure exerted by her enemies, vanished, and with it the need of unremitting vigilance by the Brit. warships. That the Brit. Navy made the B. effective seems beyond doubt, inasmuch as only a few Ger. vessels were able to get through and return.

Blockade in the Second World War. The effectiveness of B. was one of the most important lessons from the First World War, and its importance was increased in total war. Hence immediately the Second World War started, plans were made to revive and improve the methods that had been developed in 1914-18. A ministry of

economic warfare (q.v.) was instituted in Britain. The list of absolute contraband (q.v.) issued by the ministry included not only arms and munitions, but fuel, transport machines, and animals, articles of communication, coin and bullion, etc.; and conditional contraband, which might be seized if destined for the Ger. Gov. or its forces, comprised all kinds of food, forage, clothing, and articles and materials used in their production. The maritime B. of Germany was one of the chief weapons of the Allies from the beginning, and therefore command of the sea was vital. In this economic warfare the neutral countries occupied a position of the first importance, for they could be the means whereby Germany could deliver a deadly economic flanking attack, e.g. by obtaining unlimited iron-ore supplies from Sweden. Hence the W. neutral countries were under strong diplomatic pressure from both sides from the start of the war. As regards Amer. supplies, Roosevelt improved the Allies' position in 1939-40 by the Act of 4 Nov. 1939, which replaced the ban on supplies by the principle of 'cash and carry,' adopted for sales to all belligerents. Under this Act no arms could be carried to any belligerent in Amer. ships, and Amer. ships were not allowed to enter the war zone and so were not available to the Allies, but there was the compensating factor that this very provision was likely to prevent any major Amer. grievances from developing, as in the previous world war, against the allied B. Of course allied shipping was hampered by the violence of Ger. methods of sea warfare; but Ger. shipping was swept from the seas. The prin. route left open to Ger. shipping was along the Norwegian coast, but the daring of Brit. destroyers and submarines imposed a strong veto on this route. By 1940 the B. was being extended further afield. It was found that foods were being shipped to Germany via Vladivostok, and that Germany had made overtures to the Soviet and Japan for U-boat bases in the Pacific; hence allied naval counter-measures were taken in the Far East. By the spring of 1940 the economic pressure on Germany was tightened still more. For the Allies were not inclined to allow the maintenance of legal neutrality by the small nations to operate in practice to the advantage of Germany. They employed, however, none but legal means to diminish this advantage, e.g. by an extensive purchasing policy designed to withhold neutral products from Germany. New trade treaties were made which provided that the countries concerned should voluntarily limit their imports to prevent them from acting as mere channels of supply to Germany. But it was made clear that if the neutral country did not take this action voluntarily, it would be imposed on it by the allied B. It was clear by June 1940 that Britain's command of the sea could not be seriously disputed by any naval means in the power of the Axis. Only by air supremacy could they hope to challenge Brit. sea

power—hence the launching of daily air-raids on Britain. But the extension of the field of Ger. conquest in 1940 seriously increased the problem of Britain's maintenance of the B., for it gave Germany greater resources, while the downfall of France gravely diminished the blockading forces. The burden now fell on Britain alone; though the very fact that there were now fewer neutral prejudices or susceptibilities to consider was in itself an allied asset. The B. was also applied to France after the armistice of 1940. The unoccupied regions of France, as well as Spain, were subjected to import rationing at Britain's discretion. An extension of the navicert system at the end of July imposed even stricter control; and the stranglehold by sea was powerfully supported by the activities of the R.A.F.

The Ger. submarine B. of the Allies was on a far greater scale than in the First World War. Germany's surface raiders in the Atlantic were easily disposed of, but the Germans turned out submarines by mass-production much faster than the Allies could sink them, and their submarine fleet had by 1942 reached dimensions threatening the very existence of the transatlantic life-line. As compared with the position in 1918 the Allies were seriously handicapped by their deprivation of bases in S. Ireland. The damage was all the greater because the Germans then had airfields in France nearly as far W. as any in Britain, and their method was to send aircraft far out into the Atlantic, whence they wirelessed to their U-boat packs the position and direction of allied convoys. But various means were found to counteract this peril, e.g. by the application of mass-production to shipbuilding (see SHIPS AND SHIP BUILDING), and by the development of radiolocation (q.v.); and the last stage of all came in Oct. 1943, when Portugal agreed to allow the Allies to use bases in the Azores, thereby enabling convoys, especially in winter, to take more southerly routes. Among ships sailing in the main Atlantic and U.K. coastal convoys the proportion lost in 1941 was no less than 1 in 191; in 1942 it was 1 in 233; in 1943 it dropped to 1 in 344, and in the last 6 months of 1943 it was 1 in 1000. A B. of the Korean coast was made by the U.S. and Brit. fleets during the critical stages of the Korean war (q.v.) 1950-3, with telling effect. See also NAVAL OPERATIONS IN SECOND WORLD WAR.

Blockhouse, small fortified defensive building, constructed in isolated places to command a large area. The B. was garrisoned by a few troops who were able to deal with greater numbers of the enemy owing to the protection afforded by the B. They were used in the S. African war, 1899-1902, for the final drive against the Boers. In this case lines of B.s were connected by wire entanglements. In the 18th cent. B.s were mounted upon rollers or on flat-bottomed boats to give them portability on land or on rivers or lakes. See BLOCH, JEAN DE.

Blocking Course, in architecture, a course of stones or bricks placed above the

cornice. It serves a practical purpose in bedding down the projecting cornice beneath it.

Blocksberg, see BROCKEN.

Blockship, vessel filled with concrete and sunk so as to block a harbour, channel, or fairway. In the First World War B.s were sunk at Portland and other naval harbours, so as to keep out the Ger. submarines. A number of obsolete cruisers were used as B.s in the Brit. raids on Zeebrugge and Ostend in 1918. In the Second World War they were used during the allied invasion of Normandy. In 1956 a number were used by the Egyptians to block the Suez Canal.

Bloemaert, Abraham (1564-1651), Dutch painter, b. Gorkum. He started his career while very young, and became a pupil of Joost de Beer. He studied at Paris, and later worked at Amsterdam and Utrecht, where he d. He is known for his portraits, etchings, and paintings on historical subjects. He had 4 sons, of whom the youngest, Cornelius, was noted as an engraver, and many pupils, including Honthorst and Cuyper.

Bloemfontein, cap. of the Orange Free State, S. Africa, was founded in 1846, and in 1880 was declared a municipality. It is situated at a height of 4518 ft above sea level on the R. Modder. It is connected by rail and road with Cape Town, Port Elizabeth, and Johannesburg. Among its public buildings are the Raadsaal, formerly the meeting-place of the Orange Free State Raad, now the seat of the prov. council, an Anglican cathedral, a large Dutch Reformed church, a state museum, and a public library. The tn hall was completed in 1937. It is noted for its live-stock market, the largest in S. Africa. Though its manufs. are few, its trade is very extensive. Its dry, healthy climate makes it a favourite resort of invalids. English is the common tongue. The pop. is 109,180, of whom 53,000 are Europeans. It was chosen as the seat of the Supreme Court of S. Africa in 1910, upon the formal declaration of its recognition as a prov. of the Union of S. Africa. Owing to its position (it is known as the Centro City), it is frequently used as a meeting-place for delegates from all provs. of the Union. It is an important educational centre, about 4000 students being accommodated. Grey Univ. College has, since 1916, been a constituent college of the univ. of S. Africa. Owing to the exceptionally clear atmosphere the Harvard and Michigan Univs. have built their observatories at B.

Blois, Peter of, see PETER OF BLOIS.

Blois, Fr. tn, cap. of the dept of Loir-et-Cher, on the Loire. It is the seat of a bishopric. The historic château, one of the great buildings of France, was a royal residence from the 15th to the 17th cents. The 3rd Duke of Guise (q.v.) was murdered here, and Catherine de' Medici (q.v.) d. here. The former abbey church of St Nicholas is a fine building in 12th-cent. ogival style. Charles of B. and Louis XII were b. here. It manufs. porcelain and jewellery, and has a trade in wine, wood, and grain. Pop. 26,800.

Blok, Aleksandr Aleksandrovich (1880-

1921), famous Russian poet, a leader of the younger Symbolists and the most outstanding poet of the school. At first strongly influenced by the ideas of Vladimir Soloviev (q.v.), B. began his literary career with *Poems of the Beautiful Lady*, 1905, filled with adoration of the ideal woman. Then came a reaction: in *Nocturnal Hours*, 1911, he bitterly mocked his former self and his former ideals—his poems were now devoted to pictures of city squares and restaurants filled with human wreckage. The First World War gave a new turn to his genius, filling him with love of his country. B. welcomed the 1917 revolution as the crumbling of the old bourgeois culture which repelled him. Standing close to the

Blom, Eric (1888-), Eng. musicologist. He has been music critic in turn for the *Manchester Guardian* in London, the *Birmingham Post*, and the *London Observer*. Through his books and his editing of *Music & Letters* he has earned a wider reputation for musical scholarship, culminating in his editorship of the fifth (1954) ed. of *Grove's Dictionary of Music and Musicians*. C.B.E. and Hon. D.Litt., 1955. His own works include *The Limitations of Music*, 1928, *Mozart* (Master Musicians Series), 1935, *The Music Lover's Miscellany*, 1935, *Beethoven's Pianoforte Sonatas Discussed*, 1938, *A Musical Postbag*, 1941, *Music in England* (Pelican Books), 1943, and *Everyman's Dictionary of Music*, 1954.



South African Railways and Harbours

BLOEMFONTEIN

Left Socialist Revolutionaries (see SOCIALIST REVOLUTIONARIES) he co-operated with the Bolsheviks after they seized power. In 1918 he pub. his 2 famous poems, *The Twelve*, an apotheosis of the revolution, and *The Scythians*, an appeal to the West to join revolutionary Russia. Soon, however, B. became disillusioned with the Bolshevik dictatorship, and in the address he delivered at the anniversary of Pushkin's death in 1921 he said: 'Peace and freedom are taken away . . . and the poet dies because he can no longer breathe: life has lost its meaning.' He d. a few months later. See *The Twelve*, 1920, and *The Spirit of Music*, 1946 (selected essays on art and politics), both trns.

Blok, Pieter Johann (1855-1929), Dutch historian, b. Helder and studied at Leyden. He was prof. of hist. at Groningen, 1884; at Leyden, 1894; and directed the historical studies of Queen Wilhelmina. His special study was social-political hist. of Netherlands in the Middle Ages. His pub. include *Eene Hollandische stad in de middeleeuwen*, 1883, and *Willem de eerste, Prins van Oranje*, 1919-20.

Blomberg, Werner Eduard Fritz, Baron von (1878-1946), Ger. field marshal. After serving as a staff officer during the First World War, he entered the Reichswehr Ministry in connection with the work of Ger. disarmament. He was, however, associated with Gen. von Fritsch in building up a secret army in Germany in contravention of the treaty of Versailles. When Hitler came to power B. became minister of war, but he never secured Hitler's full support. He had, in consequence, to resign from the Ministry of War in 1938, as a result of the unpopularity of his second marriage. He d. from heart failure at Nuremberg.

Blomefield, Francis (1705-52), topographer, b. Fersfield, Norfolk. He is known principally by his work, *An Essay Towards a Topographical History of the County of Norfolk* (1739-75), which gives extensive information concerning his native co. He did not live to complete it, however. It was continued by C. Parkin, who pub. it in 5 vols. From 1805 to 1810 it was again pub. in 11 vols.

Blomefield, Leonard (1800-93), naturalist, formerly Leonard Jenyns, educ. Eton

and St John's, Cambridge. In 1835 he pub. his excellent *Manual of British Vertebrate Animals*. From 1828 to 1849 he was vicar of Swaffham Bulbeck, Cambs, and, although the chair of zoology at his own univ. was offered him, he refused to give up his parochial work. In 1860 he settled at Bath and presented to the Univ. the Jenyns Library of 2000 vols., dealing mostly with natural hist., and his fine herbarium of Brit. plants.

Blomefield, Sir Thomas (1744-1822), Brit. general and colonel-commandant of the Royal Artillery, was with Adm. Hawke's fleet at Quiberon, served in the W. Indies at the capture of Martinique and Havana, and became in 1771 aide-de-camp to Gen. Conway. As brigade-major he constructed floating batteries on the Canadian lakes; he was wounded at Saratoga. In 1779 he was appointed superintendent of the Royal Brass Foundry, in which capacity he carried out much-needed reforms, substituting cast-iron and brass guns for the inferior ordnance he was obliged to condemn. In the expedition against Copenhagen in 1807 he distinguished himself by his command of the artillery, and from 1779 to his death made full use of his scientific experiments in gunnery in his work as inspector of artillery.

Blomfield, Sir Arthur William, A.R.A. (1829-99), architect; R.I.B.A. Royal Gold Medallist, 1891; b. London, son of the Bishop of London; was articled to P. C. Hardwick, and began practice 1856. He restored sev. Eng. cathedrals, including Canterbury, Chichester, Lincoln, and Salisbury. In 1887 he became architect to the Bank of England and designed the Law Courts Branch. Other works: Royal College of Music, Kensington, 1883; St Mary's Church, Portsea; the nave and S. transept of Southwark Cathedral, 1890-7; the Cathedral Library, Hereford; school chapels at Malvern and Halesbury; the Whitgift School, Croydon; the Bancroft School; Selwyn College, Cambridge; Sion College Library, London; etc.

Blomfield, Charles James (1786-1857), Eng. bishop; son of a schoolmaster at Bury St Edmunds. From his father's school he proceeded to Trinity College, Cambridge, of which he became a fellow in 1809. In 1810 he took holy orders and became incumbent of St Botolph's, Bishopsgate, 9 years later. In 1822 he was appointed archdeacon of Colchester. He was appointed Bishop of Chester in 1824, from which place, after holding office for 4 years, he was translated to London. As a classical scholar he possesses some standing, and his eds. of Aeschylus, Callimachus, and Euripides are erudite and scholarly. His work as an ecclesiastic was active and thorough. One of his objects was the building of additional churches. He personally superintended the organisation of a scheme to build 50 simultaneously.

Blomfield, Sir Reginald Theodore, R.A. (1856-1943), architect and writer on architecture; President R.I.B.A., 1912-14; Royal Gold Medallist, 1913; b. Bow, Devon, son of a clergyman. After leaving

Oxford, he was articled to his uncle, Sir A. W. B. (q.v.). His first two books—*The Formal Garden in England*, 1892, and *A History of Renaissance Architecture in England*, 1897—led to a practice which included the remodelling of sev. country mansions and their gardens, e.g. Brocklesby Park, Apethorpe, Chequers, and Mellerstain. Among his other important works were a large warehouse in Westminster for the Army and Navy Stores; the Usher Art Gallery, Public Library, and Water Tower at Lincoln; Lady Margaret Hall, Oxford; the United Univ. Club, the refacing of the Carlton Club, Lambeth Bridge, the Quadrant in Regent Street—all in London; the 'Cross of Sacrifice,' the Munin Gate, and sev. cemeteries for the War Graves Commission, 1918-26; 'The Headrow' (a new street) in Leeds. Besides the books mentioned above, he produced sev. more scholarly vols., including his *History of French Architecture from 1494 to 1774* in 4 vols.

Blommaert, Philip (1808-71), Flem. author and scholar, b. Ghent. In collaboration with Conscience he worked to secure the revival of the Flem. language. His eds. of *Theophilus* in 1836, a Flem. poem of the 14th cent., and *Oudvlaamsche Gedichten* in 1851 earned him fame as an anti-French zealot. But his greatest work is his hist. of the Belgians, 1849.

Blommers, Bernardus Johannes (1845-1914), Dutch painter, b. The Hague. He painted interiors, landscapes, and scenes of humble life. In 1875 his 'Where are the Pigeons?' won him much fame. See *Roose's Dutch Painters of the Nineteenth Century*, 1898-1901.

Blöndal, Sigfús (1874-1950), Icelandic philologist and classical scholar, chief author of the great Icelandic-Dan. Dictionary. For his other works see P. E. Olason, *Íslenskræ æviskrár*.

Blondel (fl. c. 1190), Fr. minstrel, traditionally famous as the means of securing the ransom of Richard I after his imprisonment by Leopold, on his journey home from Palestine. A late 13th-cent. *Chronicle of Rheims* is the sole source of this tradition. Some poems which have survived as having been written by a B. de Nesle are attributed to him.

Blondin, Charles (1824-97), rope-walker, b. St Omer, France. His real name was Jean François Grandet. His professional career began at 5 years when his talents earned for him the title of 'the Little Wonder.' Trained at Lyons, he devoted his abilities to rope-walking, and on his successful attempt to cross Niagara Falls on a rope 1100 ft long and 160 ft above the water, achieved instantaneous popularity. He performed the same feat many times, varying it with different accompaniments, among which were those of carrying a man across on his back, performing blindfold, wheeling a barrow, and on stilts. He d. at Ealing, London. Vast crowds flocked to his performances, the gathering at his first attempt over Niagara Falls numbering over 25,000.

Blood, Thomas (c. 1628-80), Irish adventurer, commonly styled Col. B. He

received presents of estates in Ireland in return for military services rendered to the parl. side. These were forfeited at the Restoration, but he later regained possession of them from Charles II. In 1663 he tried to seize the lord-lieutenant of Ireland at Dublin Castle; in 1670 he attempted to assassinate the Duke of Ormonde, possibly on Buckingham's direction. Shortly after this, he almost succeeded in thieving the crown jewels from the Tower of London (1671). Charles II visited him in prison, and through his favour B. obtained his release.

Blood, the fluid by which the tissues and organs of the body are nourished and their waste products carried away. Arterial B., which is rich in oxygen, is bright red in colour; venous B., containing little oxygen, is dark red. It is slightly heavier than water (sp. gr. 1.06), has an alkaline reaction, and has a temp. of about 100° F. The quantity contained in the human body is about one-thirteenth of the whole by weight, or about 5 quarts by volume. It has a circulatory movement, being pumped through the arteries and veins by the heart at the rate of from 72 to 130 beats per min., the amount propelled being from 150 to 190 c.c. per beat. There are 2 circuits in the B. movement; from the left ventricle the fluid proceeds through the systemic circulation, communicating with all the tissues and organs except the respiratory system; it returns to the right auricle, is passed on to the right ventricle, whence at the next beat it is propelled through the pulmonary circulation, where it becomes oxygenated, returning again to the left auricle; it is once more forced to the left ventricle, where the cycle starts anew. Viewed microscopically, the B. consists of a straw-coloured fluid containing a large number of small round red bodies called red corpuscles, and a smaller number of white corpuscles or leucocytes. The yellow fluid, called *plasma*, is very complex in composition, containing water, albumins, and other proteins, and a certain amount of mineral salts, of which sodium chloride is the most important. One of the proteins, *fibrinogen*, is converted into a stringy substance, *fibrin*, when the B. leaves the body. The threads of fibrin settle down, carrying with them the red corpuscles, until the B. becomes a jelly-like clot. This process is called coagulation, and has important uses, for in a wound the B. clots as it emerges and plugs up the injured vessels. The calcium salts in the B. are essential for the conversion of fibrinogen into fibrin, so that clotting may be prevented by adding potassium oxalate, thus forming calcium oxalate, which settles at the bottom of the fluid, so that the surface does not coagulate. After the formation of the clot, a straw-coloured liquid separates out; this residue is called *serum*, and represents the plasma minus the fibrinogen. The plasma, therefore, serves as the medium for securing the mobility of the corpuscles, and also contains substances capable of producing coagulation; it is important as a vehicle for the

transport of substances from one part of the body to another and contains in its stream all the products of the chemical processes of the body (see BIOCHEMISTRY).

Red corpuscles. These are red biconcave disks of 0.008 mm. diameter and 0.002 mm. thickness. They have a tendency to run together in rouleaux when the B. is withdrawn from the body, and are so numerous that a cubic millimetre of B. contains about 5,000,000. Hence it is that their red colour dominates the B. as a whole; the red is due to the pigment haemoglobin which is enclosed in each corpuscle by a fine membrane. In addition to the red corpuscles there are always present in the blood a small number of young red corpuscles, known as *reticulocytes* because, under staining, they show a fine network, or reticulum, in their substance. Normally the number of reticulocytes is about 20 per cent of the total red cells, except in newborn infants, when the percentage is much greater. The haemoglobin is capable of combining loosely with oxygen, so that the function of the red corpuscles is to carry oxygen from the lungs to the different parts of the body. The oxygen readily combines with substances which have a stronger affinity for it than haemoglobin, so that the haemoglobin travels back to the lungs deficient in oxygen and is darker in colour. The carbonates and other waste products are carried back dissolved in the plasma. The red corpuscles do not actually come into contact with the fibres of the tissues which they feed; the lymph or part of the colourless portion of the B. acts as an intermediary, passing through the walls of the capillaries and reaching every part of the tissues. The quantity of lymph in the body is greater than that of the B., and it has separate vessels called lymphatics which ultimately communicate with the thoracic duct, by which the lymph is returned to the B. A pale colour in the blood results from poverty of red corpuscles, and is the condition called anaemia (q.v.); the result is that the tissues and organs are not adequately nourished.

White corpuscles. The leucocytes are cells consisting of protoplasm, and number 8000 per cubic millimetre of B. They are capable of amoeboid movement, that is, a corpuscle can change its shape and engulf small particles. This property renders them indispensable to the body as scavengers or destroyers of poisonous particles and germs. When disease germs are present in the B., there is a contest between their multiplying powers and the capacity of the leucocytes for absorbing them. They are found in the lymph as well as in the B., and vary in function. They are of 5 kinds: *neutrophils* (about 5000 per cubic millimetre); *eosinophils* (about 400 per cubic millimetre); *basophils* (about 100 per cubic millimetre); *lymphocytes* (about 2500 per cubic millimetre); and *monocytes* (about 800 per cubic millimetre). In addition to the red and white cells there is normally present in B. a number (from 200,000 to 400,000 per cubic millimetre) of circular bodies about

the size of red corpuscles known as B platelets. These are related to the process of coagulation and thrombus formation and, perhaps, to the repair of endothelial tissue. The B. cells are manuf. in the marrow tissue in the bone cavities, with the exception of the lymphocytes, which come from the lymphatic system, and the red corpuscles are removed from the circulation by the liver. The rate of daily destruction of red corpuscles is such that there is a complete renewal within about 120 days. For diseases of the B. see ANAEMIA; HAEMOPHILIA; LEUCOCYTHAEMIA; LEUCOCYTOSIS. For B. groups see BLOOD TRANSFUSION. See also CIRCULATION OF THE BLOOD.

Blood-bird (*Meliphaga sanguinolenta*), species of the Australian family Meliphagidae, or honey-eaters, birds with rather long curved bills and an extensible tongue. The male B. has a scarlet head and body.

Blood Heat (normal), see METROLOGY and TEMPERATURE.

Blood-letting, see CUPPING and VENECSECTION.

Blood-poisoning, see PYAEMIA and SEPTICAEMIA.

Blood Pressure, pressure that must be applied to an artery in order to stop the pulse in the vessel beyond the point of pressure. The pressure is assumed to be equivalent to that to which the blood is subjected by the force of the heart and the elasticity of the vessels; it is, however, also dependent on the thickness or hardness of the vessel wall and to some extent on various other considerations. B. P. is greatest at each heart-beat (systolic pressure), and decreases between the beats (diastolic pressure). By systolic pressure is denoted the maximum internal pressure to which the arterial walls are subjected at a time corresponding to the systole of the ventricle; the lowest point to which the pressure falls between each pulse-beat is called the diastolic pressure, and corresponds to the diastole of the ventricle. The systolic pressure in children is equal to that of a mercury column about 100 mm. high; in young adults, 120; and increases with advancing age. Up to comparatively recent times B. P. measurements were, generally speaking, concerned with the systolic pressure; but the value of diastolic readings became increasingly recognized. The arterial wall is continually subjected to this diastolic pressure; it increases with the peripheral resistance and vice versa; and a loss of elasticity of the arterial system causes a diminution in diastolic pressure. If the peripheral resistance remains normal, the diastolic pressure is greater or less according as the action of the heart is rapid or slow. B. P. increases with exposure to cold, in diseases of the kidneys, in toxæmia of pregnancy (see PREGNANCY), in arteriosclerosis and disorders of the ductless glands, and may also be affected by nervous disorders. High readings up to 250–300 mm. of mercury may be recorded in advanced cases of kidney disease. B. P. declines below the normal as the result of warmth, in wasting diseases such as

pulmonary tuberculosis, and cancer of the digestive system, and cardiac failure. As regards the method of measurement B. P. is measured by means of the sphygmomanometer, which consists of a rubber bag strapped round the arm, and of which the interior communicates by 2 tubes with a pressure gauge and a hand pump. The bag is pumped up so as to constrict the arm, and the systolic pressure is taken as that at which the pulse disappears from the vessel further down the arm. In proportion as instruments for B.-P. measurements have developed in accuracy, arterial B.-P. observations in clinical medicine have played a part of increasing importance in connection with diagnosis, prognosis, and treatment.

The treatment of high B. P. (hypertension) consists, so far as is possible, in treating the cause, combined with measures designed to lower the tension. The removal of a functionless kidney is sometimes effective in those cases in which the diseased kidney is the cause of the hypertension. An operation known as sympathectomy, in which the lumbar sympathetic nerve chains (see NERVOUS SYSTEM) are severed, is performed in some cases. The sympathetic nervous system controls arterial wall tension, and the theory of sympathectomy is that it relaxes the tension. It is successful in about 20 per cent of cases. Drugs of the methonium group, which block the sympathetic ganglia, act as a kind of medical sympathectomy and are much used. More recently alkaloids derived from the plant *Rauwolfia serpentina* have been given for hypertension with promising results. One of these drugs is marketed under the name of reserpine. A low salt diet is given in hypertension.

Blood-rain, red rain which falls in Italy and S. Europe. Microscopic examination reveals red dust from the sandy deserts of N. Africa to be the cause of the phenomenon. The cause is thought to be found in the upward force of water-spouts and whirlwinds (q.v.). Among the natives of N. Africa these rainless whirlwinds are called 'devils.' The Canary Is. are subject to similar phenomena.

Blood-stains, dried and darkened residue left on clothing, etc., after contact with blood, often important as evidence in criminal actions. The problem may be to decide whether a given stain was produced by blood or not, whether the blood was that of a human being or not, or whether the stain is recent or not. The time for which a blood-stain has been in existence can only be approximately decided by the amount of hardening or the deepening of the tint. After the blood has become black, no further change can be detected. The tests to decide whether a stain was produced by blood or not may be microscopic, spectroscopic, or chemical. The stained substance is first soaked in a solution of glycerine in water to a sp. gr. of 1.028, or in normal saline solution. This softens the stains without causing other changes. Examination under the microscope should then reveal the presence of corpuscles, which, however,

are similar in shape amongst all the mammalia except the camel tribe, where they are elliptical instead of circular. Mammalian red corpuscles are distinguished from those of all other animals by the absence of a nucleus. For spectroscopic examination a solution of the suspected substance in water is prepared. The spectrum of blood exhibits 2 dark bands, one in the middle of the green rays, and the other between them and the yellow. The addition of ammonium sulphide to the solution reduces the oxy-haemoglobin to haemoglobin, and one dark band only is exhibited. The chief chemical tests are the reaction with guaiacum and the production of haemin crystals. These tests merely decide the presence of mammalian blood, and to distinguish between human and other blood it is necessary to make use of the effect of inoculating animals with the blood of a different species.

Blood Transfusion. transfer of blood from 1 individual, the donor, to a recipient. The process was known in England and France in the 17th cent. The first experiments were made with sheep, dogs, and cats, but early in the 19th cent. attempts to transfuse the blood of human beings were made in England, and later in Germany, often with disastrous results. Some of these probably received an explanation in Jansky's discovery (1907) of 4 different types of human blood, and the fact that, when 2 of these are mixed, agglutination of the red corpuscles occurs in certain cases. In modern practice samples of blood for transfusion are tested for the ABO groups and for the Rh factor (*see also* ONSTRERICS). The ABO system of grouping depends upon the existence on the surface of red blood cells of 2 antigens known as A and B. Some people's red cells may have antigen A on them; others may have antigen B; others may have A and B; while yet others may have neither. All human red cells are therefore classified into groups—A, B, AB, and O—according to the presence on them of either, neither, or both of these antigens. When the blood of a person whose red cells carry antigen A is mixed with a serum containing an antibody to antigen A, the antibody (anti-A) causes the antigen-A-carrying red cells to stick together, or agglutinate as it is called, into clumps. Red cells carrying antigen B react similarly with serum carrying anti-B antibody. Red cells carrying antigens A and B (group AB blood) will, of course, react with serum containing either anti-A or anti-B, while group O blood, the red cells of which carry neither A or B antigens, will not react with any serum. The presence of antibodies in human serum is governed by the rule that every person's serum contains those antibodies which will not agglutinate the red cells present in their own blood. Thus group A blood which has antigen-A-carrying red cells, has anti-B antibodies in its serum; and group B blood has anti-A serum antibodies. Group AB blood has neither anti-A nor anti-B antibodies, but group O

blood (which has no A or B antigens on its red cells) has both A and B antibodies in its serum. With this knowledge of what may occur if a recipient's serum is incompatible with a donor's red cells, it may be understood that, except in emergency, a patient is always given a transfusion of blood of his own group. In an emergency, however, group O blood can without great danger be given to anyone.

Every person, whatever his or her ABO blood group, is either Rh-positive or Rh-negative—that is, the red cells either contain or do not contain an antigen known as the Rh factor. The corresponding antibody (anti-Rh) is not normally present in the serum of Rh-negative persons, but if such a person is transfused with Rh-positive blood or bears a child whose blood is Rh-positive, he or she may as a consequence develop anti-Rh antibody in the serum. A subsequent transfusion of Rh-positive blood would then lead to a severe reaction or, in the case of a mother, a subsequent pregnancy with an Rh-positive foetus might cause the foetus to suffer from haemolytic disease.

In deciding what blood is suitable for a given recipient the prin. consideration is the absence of reaction between the red cells of the donor and the serum of the recipient. Tests are in general carried out by mixing a small quantity of the donor blood with a small quantity of standardized anti-A or anti-B serum in glass tubes. At the end of 2 hrs these tubes are examined microscopically, and from the presence or absence of agglutination the ABO group of the donor blood can be discovered. Similar tests are done to ascertain the Rh grouping. As an additional safeguard it is usual also to test for the presence of anti-A, anti-B, and Rh antibodies in the donor serum by the use of red cells known to be of groups A, B, and Rh positive. It is customary now to test the blood of all pregnant women for Rh as well as ABO. There are other and rare antigens of the Rh complex, known as C, D, and E, which may also have to be tested for, and as time goes on no doubt other rare antigens will be discovered. The problems of B. T. are greater than may appear at first sight. The taking and matching of blood is now carried out by the National Blood Transfusion Service, which is a part of the National Health Service administered under the regional hospital boards.

The original method of transfusing blood consisted in securely applying the cut end of an artery of the donor to the cut end of a vein in the recipient's forearm. The technique of this method required considerable skill. But B. T. from the artery has long been discarded, and the blood is now drawn invariably from the vein of the donor. During the First World War, when immediate transfusion was the only means of saving the life of many of the wounded, a quick and safe means of effecting it was essential. Frequently the artery and vein were connected by a sterilised cannula, a curved glass or silver tube of fine bore. A more rapid means was introduced by Capt.

O. H. Robertson, who collected the blood of the donor in a graduated bottle containing 3.8 per cent of sodium citrate solution to prevent coagulation. He then pumped the mixture from the bottle into the veins, through a needle of selected bore, and was thus able to regulate and measure the amount transfused and to give it with least inconvenience to the patient. B. T. is now invariably given by the intravenous drip method. A cannula inserted into a vein of the recipient is connected by flexible tubing to a bottle containing the blood to be transfused. The bottle is suspended above the level of the patient so that the flow of blood takes place by gravity. The rate of flow is governed by adjusting the pressure of a screw clip placed on the rubber connecting tube.

Hous and Turner (1916) discovered that blood could be preserved without deterioration for periods up to 3 weeks by keeping it in a refrigerator at a temp. just above its freezing-point, so that it is possible to have at hand reasonably large quantities for use in emergency.

B. T. has been extensively used to repair loss of blood through haemorrhage, haemophilia, and anaemia, and its use as a prophylactic against shock is increasing. It is administered before operations in cases of debility, toxæmia due to burns, and in certain kinds of gas poisoning.

During the Second World War greater use was made of B. T. than ever before. Instead of whole blood, the plasma alone was often employed, i.e. blood from which the red and white corpuscles had been removed. It was found that, if the plasma was carefully dried, it could be stored for indefinite periods, and then reconstituted by dissolving in sterile distilled water when required. A second advantage of plasma over whole blood is that it can be transferred to an individual of any blood group without causing agglutination of the corpuscles. See G. Keynes (ed.), *Blood Transfusion*, 1949, and P. L. Mollison, A. E. Mourant, and R. H. Race, *The Rhesus Blood Groups and their Clinical Effects* (Medical Research Council Memorandum No. 27).

Blood Vengeance. Among primitive tribes, where there was no central authority to maintain order and justice, each community was bound to defend itself, and this induced in every family or clan a strong feeling of solidarity for purposes of protection or retaliation. If one member of it was injured all the rest were zealous for retribution. There seems to have been practically no distinction drawn in very early times between accidental and intentional homicide. The blood feud or vendetta (q.v.) still exists in some countries and was known until recently in Corsica. Among the Hebrews, however, it was recognised that deliberate murder stood on a different footing from accidental manslaughter, and though the *goel kaddam* (from *goel*, the nearest kinsman) in both cases sought for revenge, yet there were provisions made for securing to an unintentional homicide a place of refuge and a fair trial. For such the altar

of the tabernacle and the cities of refuge were sanctuaries (Exod. xxi, Num. xxxv, Deut. xix).

Blood-worm is the popular name applied to the larvae of some dipterous insects of the genus *Chironomus* and family Chironomidae. In form they are worm-like, and owing to the haemoglobin present in it their blood is red; they live in mud and sand in water, and anglers use them for bait.

Bloodflower, common name of the genus *Haemanthus* (Gk *haema*, blood; *anthos*, flower), in reference to colouring. The genus is of the Amaryllidaceae, native to S. Africa. *Asclepias* (q.v.) *curassavica*, family Asclepiadaceae, of tropical America, is also called B.



BLOODHOUND

T. Fall

Bloodhound, breed of hound, deriving its name from its finely developed sense of smell. Where this sense is employed in the tracking of a bleeding creature, the blood provides the scent necessary. The dog is able to select from a constantly moving herd of deer the wounded one, and to track it down. It is sometimes alluded to as a sleuth-hound, from the Middle-Eng. word sleuth, meaning track. It is probable that from the B. all other varieties of the hound breed are descended. Their use in sport and in the sterner purposes of man-hunting dates from the Romans. Until the abolition of the slave trade in America, their use in tracking runaway slaves was almost universal, though the variety of hound then used was not the pure B., but a type called the Cuban hound. This type is different from the true, and resembles a breed obtained by crossing mastiffs with bulldogs, but their inferiority in qualities of perceptive scent was balanced by their ferocity. It is sometimes called the Cuban mastiff. The method of the B. in retaining the scent of its quarry is to follow it steadily and slowly till it is successful in reaching the object pursued. If, however, the scent is lost, the sagacious animal carefully retreats along the unsuccessful path till the scent is found, when it makes a fresh attempt in another direction. The characteristics of the B.

are as follows: The head is long and dome-shaped, with large pendulous ears; between the eyes and above them are puckers of the skin, which add to the dog's already intelligent expression; the eyes themselves are somewhat fierce in expression, as the third lid is visible, which results in a bloodshot expression; in the purest breeds no white is visible. Its physique is strong and muscular. The colour is deep tan, occasionally with black spots.

Bloodroot (*Sanguinaria canadensis*), low-growing, N. Amer. herb, family Papaveraceae, with white flowers and blue-grey leaves; the rhizomatous root was used medicinally.

Bloodstone, dark green chalcedony (q.v.) with spots of red jasper (q.v.).

Bloody Assize, see JEFFREYS.

Bloomer Costume. About 1848 the 'Woman's Rights Movement' in America gave rise to the adoption of an attire for its members somewhat resembling that of men. In the following year, 1849, Mrs Bloomer gave her name to a costume which consisted of a short jacket, a short skirt reaching just below the knee, and a pair of 'bloomers' made on the pattern of Turkish trousers. The courage necessary to adopt this form of apparel was found wanting in many, and only a few followed Mrs Bloomer's advice.

Bloomfield, Maurice (1855-1928), Amer. orientalist and philologist, b. Bielitz (then Austria), now Bielsko (Poland). Was brought to America when 4 years old. In 1881 appointed prof. of Sanskrit and comparative philology at Johns Hopkins Univ., Baltimore. He wrote about 200 pubs. on comparative and historical grammar, and on Indian languages, literature, hist., and religion. He also ed., trans., and interpreted various Sanskrit texts. His main works are *Atharva Veda*, 1899, *Cerberus*, 1905, *A Vedic Concordance*, 1906, *Religion of the Veda*, 1908, *Rig-Veda Repetitions* (2 vols), 1916, and *The Life and Stories of the Jaina Saviour Pārśvanātha*, 1919.

Bloomfield, Robert (1766-1823), poet, b. Houlington in Suffolk. While still a boy he went to London and worked as a shoemaker in extreme poverty. His first and chief poem, *The Farmer's Boy*, was pub. in 1800 and met with great success. The Duke of Grafton got B. an appointment in the seal office and afterwards allowed him a small pension. Others of his works are *Rural Tales*, 1802, *Wild Flowers*, 1806, *The Banks of Wye*, 1811, and *May Day with the Muses*, 1822. In spite of influential friends he d. in poverty.

Bloomfield, tn of New Jersey, U.S.A., in Essex co., NW. of Newark. The manufs. include woollens, rubber products, chemicals, porcelains, cosmetics, and pharmaceuticals. It has a Presbyterian college and seminary. Pop. 49,300.

Bloomington: 1. City and cap. of McLean co., Illinois, U.S.A., in an agric. and coal-mining area, 35 m. ESE. of Peoria, with large railway shops. B. manufs. heaters, and air-conditioning and ventilating equipment. Illinois State Normal Univ. is near by. Pop. 34,200.

2. City, cap. of Monroe co., Indiana, U.S.A., 45 m. SSW. of Indianapolis. It is the seat of Indiana Univ. (15,000 students). It has limestone quarries and manufs. furniture, flour, and glass products. B. was settled in 1818. Pop. 28,200.



Hulton Picture Library

MRS BLOOMER

Bloomsburg, co. seat of Columbia co., Pennsylvania, U.S.A., on Fishing Creek, 40 m. SW. of Wilkes-Barre. It manufs. carpets, clothing, and rayon, and a state teachers' college is here. Pop. 10,630.

Bloomsbury, dist. of London bounded by Tottenham Court Road, Euston Road, Gray's Inn Road, and New Oxford Street-Holborn, noted for its fine squares and

wide streets. It takes its name (originally *Blemundsheri*) from one Blemund who owned the land in the reign of King John. Modern development begins with the building of the 4th Earl of Southampton's house and the laying out of B. Square in 1660. Some good 18th- and early 19th-cent. buildings survive. B. is noted as an intellectual centre, and between the 2 world wars there was a 'Bloomsbury Set,' including Lytton Strachey, J. M. Keynes, Roger Fry (qq.v.). It is an area of many publishing offices, hotels, and boarding houses. Among its public buildings are the Brit. Museum, Univ. College, the Senate House, Library, and other buildings of London Univ.

Blount, Charles (1654-93), deist, b. Upper Holloway. His *Anima Mundi*, 1679, was criticised for its scepticism, and banned by the Bishop of London. Best known is his *Philostratus concerning the Life of Apollonius Tyaneus*, 1680.

Blount (or Blunt), Edward (d. 1588-1632), Eng. printer and stationer, of St Paul's Churchyard, London; son of a London merchant tailor. His most outstanding pub. was in 1623, when, in collaboration with another printer, Isaac Jaggard, he brought out John Hemming's and Henry Condell's ed. of Shakespeare's plays, known as the first folio. B.'s name appears as one of the printers of the folio, both on the title-page and in the colophon. His first venture, as registered in extant stationers' books, was Joshua Sylvester's *The Profit of Imprisonment*, 1594. He also produced the *Hero and Leander* of Marlowe, of whom he was an intimate friend. Other famous books issued by B. were Florio's trans. of Montaigne's *Essays*, 1607, and Shelton's first Eng. trans. of *Don Quixote*, 1620. B. was also known as a translator himself, one of his best achievements being *Ars Aulica, or the Courtier's Arte*, which he trans. from the Italian of Ducci. In 1632 he collated the court comedies of Lyly for pub.

Blount, Thomas (1618-79), Eng. antiquarian, student of law and a zealous Rom. Catholic, of Orleton, Worcs. His works include *Glossographia*, a work still of value among literary antiquarians; *Nomolexicon*, a dictionary of law terms; and *Fragmenta Antiquitatis*. His *Boswell* appeared in 1894, ed. with a biography by C. G. Thomas.

Blouse (Fr. *blouse*, etymology dubious), originally a loose-fitting upper garment worn by peasants of both sexes, the favourite colour being blue. It is still worn by landworkers and station porters. The modern B. is the feminine equivalent of the shirt, and has for many years been popular with women of all countries, and especially of England and America.

Blow, John (1649-1708), Eng. musical composer, b. Newark-on-Trent. He was one of the first choir-boys of the chapel royal after the Restoration and was made organist there in later life. He obtained his degree of doctor of music, and was appointed organist of Westminster Abbey at the age of 19 (1668); hon. Mus.D., Canterbury, 1678; succeeded by Purcell, 1679; reinstated after Purcell's death,

1695; choirmaster at St Paul's, 1687-93. He composed the anthem *I was glad when they said unto me* at the opening of the choir of the cathedral in 1697, one of a very large number, also Anglican services, secular choral odes, and the opera *Venus and Adonis*.

Blow-fly, see BLUEBOTTLE FLY.

Blow-hole, or **Gloup**, air passage connecting a sea-cave with the land surface behind the cliffs. Waves breaking into the mouth of the cave may drive a shower of spray out through the B.

Blowing-machine, contrivance for producing a continuous discharge of compressed air. The most primitive type is the ordinary domestic bellows, which consists of a wedge-shaped chamber with collapsible leather sides; the top and bottom are rigid, and the bottom is provided with a valve opening inwardly, so that as the collapsible sides are extended, the air enters. When the top and bottom are squeezed together again, the air is prevented by the valve from escaping otherwise than by the nozzle. In the double bellows there are 2 compartments separated by a fixed partition, and an inwardly opening valve is situated in the under side of each compartment. On the machine being extended and compressed by a lever acting on the lowermost rigid board, the air enters the lower compartment, whence it can only escape to the upper one, which acts as a reservoir, a weight on the uppermost rigid board producing a fairly continuous current through the outgoing pipe from the upper compartment. For blast furnaces blowing-engines, depending upon the to-and-fro motion of a steam-driven piston, are used. There is a chamber with an inwardly opening valve on each side of the piston, so that air is expelled at each stroke. Both chambers of the cylinder communicate with a large air reservoir, so that the blast is kept uniform. Fans for compressing air depend upon the centrifugal motion of air between vanes fitted to the spokes of a rimless wheel. The fan is enclosed in a cylindrical chamber somewhat eccentrically; the air is admitted at orifices around the axle, is driven towards the circumference by the revolution of the fan, and emerges through a pipe fixed tangentially. The best results are obtained with curved vanes, the convex side towards the exit. In parts of Spain a water B. is used. A fall of water is necessary, and the arrangement includes a cistern where the water collects; a wooden shaft with a few air-holes through which air is sucked as the water falls down the shaft; and a wind chest where the air and water separate. The water flows away through an exit pipe at the bottom of the chest, and the air is forced out through a nozzle by the compression induced by the continuous descent of air mixed with the falling water. Roots's rotary blower has a chamber which consists of 2 semi-cylinders separated by a rectangular space greater in width than the radius of the cylinders. Mounted axially with the cylinders are 2 revolving pieces, shaped like a figure of eight, almost

equal in length to the diameter of the semi-cylinders. They revolve in opposite directions, being at right angles every quarter-revolution. The air enters at the base of the chamber into the space between the revolving pieces, which gradually diminishes until the air is expelled at the top of the chamber.

Blowitz, Henri Georges Stephan Adolphe Oppé (1825-1903), Anglo-Fr. journalist, b. Bohemia. He acquired, when travelling, a complete knowledge of sev. European languages, and was appointed prof. of foreign languages at the Marseilles Lycée. After his marriage, in 1859, he turned to journalism, and sev. times incurred the displeasure of the authorities. His remarkable career really begins in 1873, when he became chief Paris correspondent to *The Times*. His most sensational feat was to enable *The Times* to publish the entire text of the treaty of Berlin at the actual moment it was being signed in Germany. His memoirs were pub. in 1903.

Blowpipe, weapon employed by Indian tribes of S. America both in hunting and in war. A poisoned shaft, fixed in the end of the B. or tube, is driven out by the breath. The tube, usually about 10 ft long, is made of reed or the stem of a palm. Near Pará the poisoned arrows, made of palm spines, are 17 in. long, whilst in Peru they are only about 2 in. long.

Blowpipe, instrument used with a gas or spirit flame to quicken combustion and therefore increase the temp. of the flame area. In its usual form it is a conical vessel with the mouthpiece at the narrow end and a fine nozzle inserted towards the base.

Bloxwich, ward of the co. bor. of Walsall (q.v.).

Blubber, thick fatty covering which envelops the body of the whale and of various other marine animals such as seals and penguins. It is one of the products of the whale which are of commercial value, and is the source of sperm oil.

Blücher, Gebhard Leberecht von (1742-1819), Prussian field marshal, prince of Wahlstadt, b. Mecklenburg-Schwerin. In the year 1756 he entered the service of Sweden, and 4 years later was captured by Prussians in the Pomeranian campaign. He was persuaded by his captors to enter the service of Prussia and was given a lieutenantancy. He served in the later battles of the Seven Years War. He gained promotion to the rank of captain, but retired into private life (1773). In 1778, after the death of Frederick, he was restored to his old regiment, the Red Hussars. In the following year he became a colonel, and in 1794, as a reward for his services in the Fr. campaigns, he was made a major-general. In 1801 he became a lieutenant-general. The war of 1805-6 found him active as a cavalry leader, and as such he took part in the battle of Austerlitz, and he covered the rear of Prince Hohenlohe's army on the retreat to Pomerania. He then went northward and fought in the neighbourhood of Lübeck, being in Nov. 1806 forced to surrender to the French at Ratkau, but was

soon exchanged. During the period of Napoleonic domination he was actively in touch with the national party, and was, in 1812, banished for his pronounced opinions from the court. The beginning of the War of Liberation found him placed in high command of the Prussians, and he organized the Prussian Army, becoming commander-in-chief of the army of Silesia with 90,000 men under his command. He was full of energy and was prepared to attempt anything. He defeated Macdonald at Katzbach, and by his defeat of Marmont prepared the way for the defeat of Napoleon at Leipzig. He was made a field marshal after the defeat of Marmont, and stormed Leipzig on the last day of the battle. He persuaded the allies to carry the war into Fr. ter., and by his courage and energy in the face of defeat he ultimately triumphed and led the army of Silesia directly on to Paris. He proposed that the ravages of the French in Germany should be avenged by equal ravages in Paris, but was prevented by Wellington from carrying out his proposals. In 1814 he visited England and was welcomed everywhere enthusiastically; in the same year also he was made prince of Wahlstadt. He retired to Silesia, but was soon called from his retirement to take part in the campaign of the Hundred Days. He sustained a severe defeat at Ligny, and in this battle nearly lost his life. But he moved on and marched to the assistance of Wellington. His forced march was the means of his intervening at the critical moment in the battle of Waterloo, and of turning the defeat of the French into a headlong rout. The rout was complete and decisive owing to B.'s relentless pursuit of the enemy. B. subsequently retired to his Silesian estates where he d. See memoirs, ed. Princess E. Blücher and D. Chapman-Huston, 1932.

'**Blücher**, The, cruiser of the Ger. Navy, which, with the *Seydlitz* and *Moltke*, bombarded Harlepool, Yorks, on 16 Dec. 1914. She was sunk by the British at Dogger Bank, 24 Jan. 1915.

Bludenz, Austrian tn in the prov. of Vorarlberg, on the Ill. It has a 16th-cent. church and a Renaissance castle. There is an alum industry. Pop. 9700.

Blue, Victor (1865-1928), Amer. admiral, b. Richmond co., N. Carolina. In the Sp.-Amer. war in 1898, he served with the fleet which blockaded Adm. Cervera's fleet off Santiago, Cuba. Won fame by getting ashore and learning the strength and positions of the hostile squadron. Appointed chief of the Bureau of Navigation, U.S. Navy. In the First World War he commanded the *Texas* in the N. Sea. Promoted rear-admiral in 1919.

Blue, with red and yellow (q.v.) one of the colours generally accepted by artists and others as 'primary.' Artists use as B. pigments; ultramarine, which is prepared from lapis lazuli; cobalt B., of which there are many varieties, consisting of cobalt mixed with earthy or metallic bases; indigo; Prussian B., which is ferrocyanide of iron. In dyeing the B.s form a large group of the coal-tar products.

In laundry work a B. colour is imparted to linen and cotton goods in a very faint degree to heighten the impression of whiteness; many preparations for this purpose are in use (see also COLOUR and PIGMENTS).

Blue, in sports, a man who has won the right to wear the blue cap and blazer of Oxford or Cambridge. Each of these univs. has a blues committee, which awards blues and half-blues for the chief inter-varsity contests. Full blues are awarded in rowing, cricket, rugby, soccer, tennis, boxing, athletics, and golf; in athletics the first representative in each event is a blue and the second a half-blue. Half-blues are awarded in the minor sports.

Blue-books, name given to parl. pubs., usually bound with blue covers. The idea of printing records of parl. business originated in a dispute in 1681 over the question of the Duke of York's exclusion from the throne. A statement was circulated that falsified accounts of the proceedings had been circulated, and it was therefore proposed by Sir John Hotham to print all reports. The cheap price of these pubs. has only been in vogue since 1836. From the Board of Trade a pub. is issued monthly which contains information relating to the world's trade and commerce. Ann. B. are issued by all the Brit. crown colonies and protectorates, and by the mandated ters. They give detailed information on revenue, import duties, exports and imports, currency, weights and measures, etc. The distinctive colours which mark foreign 'B.' are: America, foreign correspondence, red; German, white; French, yellow; Austrian, red; Portuguese, white; Italian, green; Japanese, grey; and Chinese, yellow.

Blue-coat School, see CHRIST'S HOSPITAL.

Blue-eye (*Lintomyza cyanotis*), species of bird of minute structure and great beauty. It is found in large numbers in New S. Wales. It belongs to the honey-eaters, and goes under the name of blue-cheeked honey-eater.

Blue-fish (*Pomatomus saltatrix*), voracious spiny-finned fish of the order Percomorphi. The E. coast of N. America is its only home. It is blue on top and whitish below, while a large black spot is seen at the base of the pectoral fins. Its food is other fish of smaller size.

Blue-gowns, Scottish term given to paupers. It originated from beadsmen who in return for a small annuity were employed by persons desirous of their efforts in prayer.

Blue Grass, or Kentucky Blue Grass, is the perennial *Poa pratensis*, and its strains, grown for pasture and lawn turf in the N. states of U.S.A., and known as Meadow Grass in Britain.

Blue Island, city in Illinois, U.S.A., adjoining Chicago on the S., in a truck-farming and dairying area. It manufa. wire, steel, and iron products, and brick. Pop. 17,600.

Blue Jay (*Cyanocitta*), Amer. genus of the Corvidae, or crow family. *C. cristata* is a beautiful bird, the plumage being blue

above, white beneath, and variegated with black and white. Like other members of its family it is a great thief, and in the spring it eats both the eggs and young of other birds, though in the summer it feeds on fruit and insects. It has a harsh and unmelodious voice.

Blue John Mine, cave of many chambers in Derbyshire, England. It is situated in Tray Cliff in the N. of the co. W. Castleton is 1½ m. distant. Blue John is a name for fluorspar (q.v.).

Blue Laws, collection of very severe laws regarding behaviour and the due keeping of the Sabbath, alleged by the Rev. Sam A. Peters in his *General History of Connecticut* to have been in force among the early colonists of New Haven and Connecticut. This allegation was at first thought to be without foundation, but they were later found, in part, to exist among the New Haven Statutes. The term is still used colloquially in reference to local ordinances concerning Sunday amusements, etc.

Blue Mountains: 1. Spur of the Dividing Range of mts in New S. Wales. They run almost parallel with the coast, 50 to 80 m. W. of Sydney. A passage was found over them leading to the Bathurst Plains in 1813. Mt Beemarang, 4100 ft, is the highest point. Parts of the roads which cross them are 3400 ft above sea level. The mts contain many popular tourist resorts and are renowned for their fine scenery. Caves exist of great size, those of Jenolan being notable.

2. Range of mts in NE. Oregon and SE. Washington, U.S.A. It extends from N. to S., passing through the co. of Umatilla. The mts are composed chiefly of granite, and their slopes are covered with great forests of pine and fir. There are gold-mines, and stock grazing and agriculture in the valleys.

3. Range of mts in Jamaica. Blue Mountain Peak is 7520 ft. The altitude of this system, whose main chain extends from E. to W., varies between 5000 and 7000 ft. It forms a popular tourist resort, being only 8 m. N. of Kingston.

4. (Kittatinny) Mt system of Pennsylvania and New Jersey, forming part of the Appalachian system. It stretches from Orange co., New York, traversing the cos. of Sussex and Warren in New Jersey. At the Delaware Water Gap the R. Delaware crosses the mts. Their structure is largely of rocks belonging to the Silurian period.

Blue Nile, see BAHR-EL-AZREK.

Blue Ox, see NYLGHAU.

Blue Peter, rectangular blue flag with a white square in its centre which is flown in a ship when she is on the point of sailing. Usually hoisted on the foremast.

Blue Pill, mercury preparation containing mercury 33 per cent, confection of roses, and powdered liquorice. It is used as a cathartic (q.v.).

Blue Print, see COPIING.

Blue Ribbon, badge of all total abstainers, who at one time styled themselves the 'B. R. Army.' The army began its career in 1878 in America,

and extended to Britain. The term probably originated from the B. R. badge which was worn by each knight of the Garter. The term is used also when speaking of some prize, as, for instance, the 'Derby' (q.v.) stakes and the Atlantic crossing (see SHIPS AND SHIPBUILDING, *The Blue Riband of the Atlantic*).

Blue Ridge, easternmost chain of the Appalachian Mts of Virginia and Carolina. It is famous for the splendour of its scenery. Its highest point is the Grandfather, in N. Carolina, 5897 ft.

Blue Roach, see AZURINE.

Blue Robin, see BLUEBIRD.

Blue Shark (*Carcharinus glaucus*), species of shark, a native of tropical seas, but a frequent visitor in warm summers to the Eng. Channel, where it destroys both fish and nets. It grows to a length of at least 25 ft.

Blue-stocking, term used rather depreciatively of a woman of learning or affecting literary tastes; especially of those who air their erudition to the exclusion of more traditional womanly activities. About 1750 a literary circle was estab. in London consisting of ladies and gentlemen, among whom was a distinguished Mr Benjamin Stillingfleet, who habitually wore blue stockings—hence the name. With the changed attitude towards the education of women, and with the increasing opportunities afforded them, the term is much less frequently used.

Blue Warbler, see BLUEBIRD.

Blue-wing (*Querquedula discors*), species of Anatidae; often called the blue-winged teal. It is a brilliantly coloured bird with bright blue wing-coverts. It is a native of N. America which migrates in winter to S. America.

Bluebell, name given to *Campanula rotundifolia* in Scotland, where it grows abundantly, and is the same as the harebell of England. It belongs to the dicotyledonous family Campanulaceae and is totally different from the Eng. B., or *Endymion non-scriptus*, otherwise known as the wild hyacinth, which is a species of the monocotyledonous family Liliaceae.

Bluebird, **Blue Warbler**, and **Blue Robin**, names given to a N. Amer. bird (*Sialia sialis*). It is recognised with as much pleasure as the robin is in England, by reason of its tameness and absence of fear of human beings. It is rather larger than the robin, though its general appearance and diet closely approach it. It lays about 6 pale-blue eggs. As a migratory bird it sounds the approach of spring with its return.

Bluebottle, see CENTAUREA.

Bluebottle Fly, name given to sev. species of Muscidae, dipterous insects related to the house-fly, *Musca domestica*. They are, however, larger than the latter. A loud buzz marks its flight, and the extent of its wings across is almost an inch. Its head is black, the thorax grey, and the abdomen blue, with 3 black stripes. Its finely developed sense of smell enables it to find the flesh upon which it lays its eggs. It thrives most numerous from spring to autumn, and

is common to Great Britain and Europe. *Calliphora vomitoria* and *C. erythrocephala* are common Brit. species; and *Sarcophaga carnaria*, the flesh-fly, a member of the family Sarcophagidae, resembles the B. F. very closely.

Bluefields River, or **Escondido River**, riv. of Nicaragua flowing into the Caribbean Sea. It is joined by the Mico, and empties itself into Bluefields Bay. The tn of Bluefields is within a few m. of its mouth. The riv. is about 60 m. in length.

Bluethroat, or **Blue-breast**, name given to a genus of birds related to the redstarts and resembling the nightingale. There are 2 species: red-spotted (*Cyanocula succica*) and white-spotted (*C. wolfi*). It possesses beauty of form and voice. Its ability to imitate the songs of other birds earned for it a Lapland name meaning a hundred tongues. The throat and upper neck are bright blue. The females are less conspicuous than the males. As a bird of passage it is known in many parts of Europe.

Blum, Léon (1872–1950), Fr. writer and politician; b. Paris, of Jewish descent, and educ. at the lycées Charlemagne and Henri IV. Master of requests to the Council of State from 1895, he also became well known as a critic on *Gil Blas*, *L'Humanité*, *Le Matin*, and *Comœdia*. He backed Jaurès in the Dreyfus affair, and joined the Socialists in 1899. He was elected deputy for Seine in 1919. Forcefully opposing the policy of occupation of the Ruhr, he assisted in founding, early in 1924, the combination of the left which led to the downfall of Poincaré and Millerand; and he was the real leader of the Socialists during the Herriot Ministry of 1924–5. He became Prime Minister in 1936; during his ministry various leagues of violence were disbanded and many reforms effected. He resigned in 1937, but was again Prime Minister in 1938, though only for a few weeks. After the fall of France in the Ger. invasion in 1940, B. was placed under arrest, and remained a prisoner in Ger. hands, being taken to Germany in 1944, where he was liberated by the allied armies in May of the following year. In Jan. 1946 B. was given ambassadorial status and placed in charge of financial and economic missions in U.S.A. and elsewhere. Subsequently to the Oct. referendum on the new Fr. constitution he became temporarily Prime Minister for the specific purpose of visiting London, where he laid the foundation of the existing Anglo-Fr. alliance. After 1946 his views as an elder statesman were constantly sought by members of all parties. His pubs. include *Le Livre de mes amies*, *Eliane*, *En lisant*, 1903, *Au théâtre*, 1905–11, *Du Mariage*, 1907, *Stendhal et le Bèylisme*, 1914, *L'Exercice du pouvoir*, 1937, and *À l'échelle humaine*, 1945. See R. L. Stokes, *Léon Blum*, 1937.

Blumenau, dist. and city in Santa Catarina, Brazil, situated on the R. Itajaí, 60 m. NW. of Desterro. The tn was founded as a Ger. settlement by Dr Hermann Blumenau, 1852. The climate is healthy, and tobacco, cereals, sugar,

and coffee are the chief products of the dist. Pop. (dist) 125,000; (tn) 55,000.

Blumenbach, Johann Friedrich (1752-1840), Ger. naturalist, b. Gotha; educ. at Jena and at Göttingen, where he became prof. in 1778, remaining at the univ. for about 60 years. During that time he lectured on natural hist., anatomy, medicine, and physiology. In 1785, and therefore before Cuvier, he estab. the dependence of zoology on comparative anatomy, and also made important contributions to ethnology. His works include *De Generis Humani Varietate Nativa*, 1775, *Manual of Natural History*, 1780, and *Manual of Comparative Anatomy and Physiology*, 1804, etc., many of which were trans. into sev. languages.

Blumenbachia, S. Amer. genus of Loasaceae with a hairy fruit of which *B. coronata* is grown as a greenhouse biennial, and *B. insignis* as a hardy ann. trailer in gardens.

Blumenthal, Leonhard, Count von (1810-1900), Prussian general. Member of the general staff, and chief of the staff of Schleswig-Holstein army, 1849. He served in the campaign against Denmark, 1864, and under Crown Prince Frederick William in Austrian campaign. B. was chief of the staff to Crown Prince of Prussia in Franco-Prussian war (1870-1871). In 1888 created field marshal.

Blümlisalp, mt group of the Bernese Oberland, Switzerland. Chief peaks: Blümlisalphorn (12,038 ft), Weisses Frau (12,012 ft), and Morgenhorn (11,927 ft).

Blundell's School, public school for boys, built in 1604 at Tiverton (q.v.) by Peter Blundell. In 1882 it was moved to the present buildings 1 in. from the tn. Blackmore was a pupil and refers to it in *Lorna Doone*.

Blundellsands, see CROSBY.

Blunden, Edmund Charles (1896-), poet and critic, b. Yalding, Kent. Educ. at Christ's Hospital and Queen's College, Oxford, he served during the First World War in France and Belgium with the Royal Sussex Regiment. His poems were pub. as early as 1914, but his first notable vol. was *The Waggoner and other Poems*, 1920, followed by *The Shepherd and other Poems of Peace and War*, 1922, for which the Hawthornden Prize was awarded. He was prof. of Eng. literature in Tokyo Univ., 1924-7. In 1931 he became fellow and tutor in Eng. literature in Merton College, Oxford, where he remained until 1943, when he joined the staff of *The Times Literary Supplement*. Later he returned to the Far E., and from 1953 was head of the Eng. dept in the univ. of Hong Kong. His sev. vols. of poems were issued in a collected ed. in 1930, and subsequent vols. were collected in a second series, pub. in 1940. His book of war reminiscences, *Undertones of War*, 1928, enhanced his reputation as a prose-writer, subsequently maintained in a different field with his biographies of Leigh Hunt, 1930, and Shelley, 1946. Other prose works include *Christ's Hospital*, a retrospect, 1923, *On the Poems of Henry Vaughan*, 1927, *Nature in English Literature*, 1928, *The Face of England*, 1932,

Charles Lamb and his Contemporaries, 1934 (the Clark lectures delivered at Trinity College, Cambridge), *The Mind's Eye* (essays), 1934, *Keats's Publisher*, 1936, *Thomas Hardy*, 1942, and *Crickel Country*, 1944. A later vol. of poems, *Shells by the Stream*, was pub. in 1944. In 1951 he was made a C.B.E.

Blunderbuss (perverted form from Dutch *donder*, thunder; *bus*, gun, originally box), short gun with a large bore, firing a number of balls or slugs. Its name may have been perverted to 'blunder' because practically no aim is taken with it. At short range it can do much damage among a number of objects. It is now obsolete. See also FIREARMS.

Blundeville, Randolph de, Earl of Chester (d. 1232), Eng. nobleman, succeeded as Earl of Chester in 1180. He married Constance, widow of Geoffrey, son of Henry II, in 1187; and married Clemence, sister of Geoffrey, c. 1200. He took John's, and later Henry III's, side against the barons in 1215, and with Fuik de Bréauté stormed and plundered Worcester in 1216. In 1217 he was made Earl of Lincoln, and the following year he went to the Holy Land. Later he plotted unsuccessfully against Hubert de Burgh. He took part in the siege of Nantes in 1230.

Blunt, Edward, see BLOUNT.

Blunt, John James (1794-1855), divine, b. Newcastle under Lyme, and educ. at St John's College, Cambridge. In 1839 he was made Lady Margaret prof. of divinity at Cambridge, and in 1854 he was offered, but declined, the bishopric of Salisbury. His best-known work was *Undesigned Coincidences in the Writings both of the Old and New Testaments*, 1833. See Prof. Selwyn's memoir of him, 1856.

Blunt, Wilfrid Scawen (1840-1922), poet, b. Sussex. Educ. at Stonyhurst and Oscott, he entered the Diplomatic Service and served in various Brit. legations in Europe. In 1869 he left the service and married a descendant of Lord Byron, Lady Anne Noel, who was a brilliant Arabic scholar and more famous among the Bedouin than even Lord Cromer. Together they travelled in the Middle E. and India, and B. wrote *The Future of Islam*, 1882, and other books. An opponent of Brit. imperialism, he championed the cause of Ireland and was imprisoned in 1888. He is best known for his poems, which include *Sonnets and Songs of Proteus*, 1875, and *Esther*, 1892. His *Collected Poems* were pub. in 1914, and *My Diaries* in 1920. See life by E. Finch, 1938.

Bluntschli, Johann Kaspar (1808-81), Ger. jurist, b. Zürich, and studied at the univs. of Berlin and Bonn, at the latter of which he graduated LL.D. in 1829. He then returned to Zürich and took part in the political war which was disturbing Switzerland. He became prof. of law at Zurich Univ., and also a member of the parliament. Here he was soon recognised as leader of the moderate Conservative party. The impossibility of bringing about acceptance of his views on gov. led him to resign, and in 1848 he went

to Munich, where he became prof. of constitutional law. Here he pub. his chief work on jurisprudence, the *Allgemeines Staatsrecht* (5th ed.), 1876. In 1861 B. was appointed prof. of political science at Heidelberg, where he again entered the political arena. At this time B. ranked as one of the greatest authorities on international law. In 1873 he founded the Institute of International Law at Ghent. Among his works are *Geschichte der Republik Zürich*, 1847, *Das moderne Kriege-recht*, 1866, and *Das moderne Völker-recht*, 1868.

Blushing, sudden suffusion of blood over the skin, caused by sensations of shame or modesty. Usually it affects only face and neck, but sometimes arms and chest also. It produces heat and a sense of discomfort, and serves to illustrate the intimate control exercised by the nervous system over the blood vessels.

Blysmus, genus of Cyperaceae. The Brit. flora contains 2 species, *B. compressus* or broad B., found in boggy pastures, and *B. rufus*, or narrow B., which occurs in marshes near the sea. Both are tolerably common, the latter species especially in Scotland.

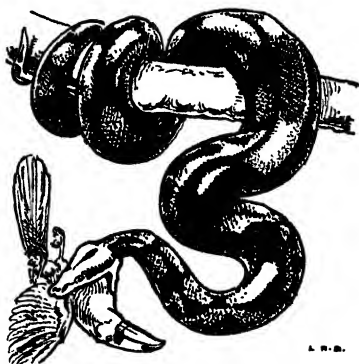
Blyth: 1. Seaport and watering-place of Northumberland, England, at the mouth of the R. Blyth (20 m. long) which here enters the N. Sea, and 7 m. N. of the R. Tyne. B. exports the coal mined locally, and has large modern building works and light industries. Pop. 34,750.

2. Vil. and par. of Notts, England, 6 m. NNE. of Worksop, with a par. church, largely early Norman in style, formed from the church of the Bonedictine priory founded at B. in 1088. Later enlarged, it has a late 14th-cent. tower, and 2 medieval wooden screens. Pop. 731.

B'nai B'rith, world-wide Jewish fraternal and service organisation founded in 1843 in New York by 12 Ger. Jews under the leadership of Henry Jones. In 1956 it had 7 grand lodges in the U.S.A. and Canada, 1 in England, 1 in Israel, 1 in continental Europe, 1200 subordinate lodges, and 380,000 members. It maintains a high morality regardless of dogma, and major activities include the Anti-Defamation League (to combat racial discrimination and prejudice) and centres of Jewish culture on college campuses. It has estab. these charitable institutions: Levi Memorial Hospital, Hot Springs, Arkansas; National Jewish Hospital, Denver; and Bellefaire (for emotionally disturbed children) at Cleveland.

Boa, name popularly given to any of those large snakes of America and the Old World which, having no poison fangs, kill by constriction. Strictly the term applies only to the New World and Malagasy constrictors, the name python being proper to the others. The boas are distinguished from the pythons by the presence of teeth in the premaxillae, and the absence of supra-orbital bones. The commonest of the species is the *B. constrictor*, about 12 ft in length, brownish-grey in colour with lines and blotches. The B. attacks small mammals and birds,

crushes the bones of its victim by pressure, and swallows it whole. A long period of torpor follows. Most of the B.s bear their young alive.



BOA

Boabdil, from the name Abu Abdullah (d. c. 1495), last Moorish King of Granada, called also *El Chico*, which means The Little. In 1482 his father, Abu'l Hassan, was dethroned and banished from the country, and B. was proclaimed king. In 1483 he invaded Castile, but was captured at Lucena, and became tributary to Ferdinand and Isabella of Castile. After that he spent sev. years in warring against his father and his uncle. In 1492 the King of Castile, after besieging Granada, captured it. B. is said to have fled to Africa, where he later d. in battle. *El último suspiro del Moro* (the last sigh of the Moor) is shown as the place from which B. last viewed Granada.

Boao, or **Boag**, tn on W. coast of Marinduque Is., Philippines. Pop. 19,687.

Boaden, **James** (1763-1839), Brit. author. He was editor of the *Oracle* newspaper in 1789. He studied at the Middle Temple, wrote sev. successful plays, and in 1796 pub. an exposure of the Ireland Shakespearian forgeries. In 1831 he pub. a work on Shakespearian sonnets identifying Mr W. H. with Wm Herbert (afterwards 3rd Earl of Pembroke). He also wrote lives of various actors and actresses.

Boadicea, or **Boudicea** (d. 61), Brit. queen, the wife of Prasutagus who ruled over the Iceni in E. Anglia. Dying, he made his wife and daughters joint heirs with the Rom. emperor, Nero, to his property, probably from a mistaken idea that this would save them at least some share of his possessions. In place of this, however, the royal line was treated as extinct, his queen insulted, his daughters outraged, and his subjects goaded by insult and oppression into rebellion. Suetonius Paulinus was with the legions attempting to conquer Anglesey. E. Anglia burst into rebellion. The Rom.

garrisons of St Albans and Colchester were annihilated, London was razed to the ground, and the whole of SE. Britain rose in revolt. Paulinus met the Britons at an unknown place, somewhere in the Midlands, and practically annihilated them. B. took poison, and the rebellion, which owed much to her leadership, was entirely suppressed.

Boanerges, 'sons of thunder,' name given by Christ to the 2 disciples James and John, the sons of Zebedee (Mark iii. 17).



WILD BOAR AND YOUNG

Boar, Wild. The commonest species is the *Sus scrofa*, larger in size than the domestic pig, and characterised by its long tusks, prominent pig-like snout, and short, thick, woolly hair closely interspersed with bristles, which on the neck form a thick mane. These bristles are brownish-black in colour, the shorter hairs being grey. The animal is about 3 ft in height, and far surpasses the domestic swine in strength and swiftness. It is native in Europe, and is now found over Europe, N. Africa, and parts of Asia. It was originally common in the Brit. Isles, and traces of it were found at Chartley Forest, Staffs, as late as 1683, and it survived even later in Ireland and Scotland. It is still found in most parts of the Continent, where it is common in damp and marshy ground. B.s in early times proved very destructive to crops, for they are voracious and omnivorous, and feed chiefly by night. Solid benefit was, therefore, to be gained by hunting them, and their ferocity gave the business the touch of danger necessary to make it a sport. Under the Norman kings the B. was one of those beasts the killing of which without right was punishable by death. B.-hunting was then a lordly sport, and a vivid account of its pleasures is given in the 14th-cent. poem of *Sir Gawayne and the Green Knight*. The B. was hunted on foot and on horseback with dogs, most commonly B.-hounds. The B.'s head was then accounted a great delicacy, and its entrance at the Christmas festivities was greeted with elaborate ceremonial and many carols. In heraldry

it is a well-known cognisance. Other species of *Sus* are known: *S. vittatus*, *S. verrucosus*, and *S. barbatus*, all Asiatic.

Boar-fish (*Capros*), genus of fishes chiefly found in the Mediterranean and NE. Atlantic. It has a flat oval body, similar to that of the related John Dory. Its body is carmine, with 7 transverse orange bands on the back, and the name is derived from its projecting hog-like snout.

Board, name generally given to a body of persons appointed jointly to control some public office, bank, or railway. Thus, for example, when referring collectively to the directors of a railway or a bank it is customary to refer to the B. of directors. Similarly the Lords of the Treasury form the B. of Treasury, whilst the name is or was in common employment, having the same meaning, in such terms as the B. of Guardians, the Local Gov. B., the B. of Trade, and in Scotland the School B. The chief State dept to bear this name is the B. of Trade (see TRADE, BOARD OF). The former B. of Education and the B. of Agriculture and Fisheries have been estab. as ministries (see EDUCATION, MINISTRY OF; AGRICULTURE, FISHERIES AND FOOD, MINISTRY OF). Similarly, the B. of Works, later the Office of Works and Public Buildings, is also estab. as a ministry (see WORKS, MINISTRY OF), and the former Local Gov. B. is now known as the Ministry of Health (see HEALTH, MINISTRY OF). Other important B.s are the London Passenger Transport B., the body which, in 1933, became the sole owning and organising authority for the omnibus, train, and tube system of the metropolis and suburbs (see LONDON TRANSPORT EXECUTIVE); and the Central Electricity B., which was estab. by Act of Parliament in 1926 to re-organise, unify, and develop the generation of electricity in Great Britain (see BRITISH ELECTRICITY AUTHORITY and CENTRAL ELECTRICITY BOARD).

Board of Trade Unit is now known as the kilowatt hr. It means 1000 watt-hrs.

Boarding, in naval tactics, term used for an assault made by one ship upon another. It is now, however, not much practised. B. may be performed on different parts of the ship according to the position of the ships.

Boardman, George Dana (1801-31), Amer. missionary, b. Livermore, Maine; went to India in 1825 as a Baptist missionary, and later did good work among the Burmese Karens.

Boardman, George Dana (1828-1903), Amer. Baptist minister, son of above, travelled alone from Burma to America at the age of 6. After graduating at Brown Univ. he held pastorates at Rochester and Philadelphia, and became president of the Amer. Baptist Missionary Union (1880-4).

Boarmia, genus of lepidopterous insects of the family Geometridae. All the species of these moths are of an ashy colour, or white minutely dotted with brown, and the large wings, when at rest, are placed horizontally. Many species are found near London.

Boar's Hill, vil. of Berks, England, 4 m.

N. of Abingdon. The hill itself is 550 ft high. On it is Ripon Hall, a college for candidates for holy orders in the Church of England.

Boas, Franz (1858-1942), Amer. anthropologist, b. Minden, Germany. In 1883-4 he explored Baffin Land, and the following year he became assistant curator of the Royal Ethnological Museum, Berlin. In 1886 he went to N. America and finally settled in the U.S.A., becoming, in 1899, the first prof. of anthropology at Columbia Univ. He was the pioneer of anthropological work in the U.S.A. and almost all later Amer. anthropologists of note were trained by him. He carried out extensive research among the Indians of the NW. coast, the results of which were pub. over many years in Amer. Jours. He was a vigorous opponent of Nazi race theories. His books include *The Mind of Primitive Man*, 1911, *Primitive Art*, 1927, and *Race, Language, and Culture*, 1940. See R. H. Lowie, *The History of Ethnological Theory*, 1937.

Boat (O.E. *bāt*), open vessel used for travel on the water, propelled either by sail, by motor, or by oar. The term 'ship' is generally reserved for larger vessels. The origin of vessels for conveyance on water may doubtless be traced to a double genesis. When primitive man wished for some such thing, 2 means must have suggested themselves to him. He could hew down a tree and hollow it out, or he could collect wood and bind the pieces together. Hence arose the 'dug-out,' still so common a B. among savage tribes, and the raft, the construction of an elaborate form of which is described at length in the *Odyssey*. From this last came the junk and punt and all the various kinds of flat-bottomed craft. Another stage in development may be the coracle of the auct Celts, consisting of a wicker framework over which skin is stretched. By another step, the framework would be made stronger and the covering made of wood. There are differences in the ways of laying on the planks in the modern small B., viz. the planks may be laid edge to edge, so as to present a smooth exterior; the B. is then said to be carvel-built; or the planks may overlap, and the B. is described as clinker-built. Types of B.s vary in every part of the world and for every different class of work. Some are swift, some roomy, some for pleasure, some for rough weather. In the Royal Navy the following B.s are used, though here, as in other branches of service, steam and motor are taking the place of wind and oar, which now propel only the smallest B.s. The *pinnace* is generally about 35 ft long, carrying 8 oars. The *cutler*, about 30 ft long, carries more men and has greater breadth. The *gig* is used on expeditions requiring speed. It is narrower than the pinnace, is 30 ft in length, and weighs about 8 cwt. The *dinghy* is a small B. of 3 cwt., about 13 ft long, and easily rowed by 2 men. B.s vary considerably in shape and size round the coast of Great Britain. On the Thames they are lightly built, but on

the coast the necessity of pulling them over rough ground demands that they should be strong and generally clinker-built. Round the coast of Kent and Sussex short, square-sterned skiffs are in favour, and further W. along this coast the B.s get deeper and larger, and the carvel-built is still common. In the NE. of England and at the N. of Scotland, various old types of B.s survive. The *coble*, for example, is a shallow-built, flat-bottomed B. with a very curious rudder, built for launching from the beach in rough weather. These show traces of Norse and Dutch influence. Pleasure B.s of most kinds may be seen on the Thames, and the following are easily noticeable: the randan skiff about 30 ft long, 4 ft beam, for 1 sculler between 2 rowers, and various skiffs, eights, fours, gigs, and punts. These are of varying degrees of lightness, and this type finds its best expression in the racing eights seen in the Oxford and Cambridge boat race.

Boat, Life, see LIFEBOATS.

Boat-fly, name of sev. species of hemipterous insects of the family Notonectidae. They are aquatic, swim on their backs, live on animal matter, hibernate in mud, and when they dive into water carry with them a supply of air. *Notonecta glauca*, the water-boatman, is found in Britain.

Boat Race, see ROWING.

Boatbill, or **Boatbilled Heron** (*Cochlearius cochlearius*), bird belonging to the Ardeidae, or heron family, but differing from allied species in its broad, flat, brown bill. It is a night-flying bird, feeds on fish and worms, and is a native of Brazil.

Boatswain (pronounced 'bo'sun,' from *boat* and *swain*, a servant), warrant officer of the R.N. In the days of sailing ships, he had charge particularly of the boats, rigging, sails, cables, anchors, flags, and cordage. It was his duty to examine these carefully, especially when the vessel was in dock, to keep them in a state of repair, and to make report of their number and condition. By means of his whistle, which gradually came to be looked on as his badge of office, he summoned the crew to their duties. He shared in the work of the ship, and took a place in one of the watches. He himself gives no orders, but acts as the officer of the first lieutenant. His work has of course been considerably modified by the general use of steam.

Boaz, Bethlehemite and direct ancestor of Christ (Matt. i. 5); married Ruth. They were great-grandparents of David.

Boaz and Jachin, see JACHIN and BOAZ.

Bobbin, small wooden or metal roller, flanged at both ends (rarely at one only), and bored through the axis, so that it may be placed on a spindle. The commonest form is the spool on which ordinary sewing thread is wound, and an example of the metal B. is to be found in that which carries the thread in a sewing machine. B.s of various sizes and shapes are used for the different stages of spinning flax, wool yarn, etc., the largest being those used for the slubbing frames, where the

cotton passes from the lap shape in which the carder has left it into loose strands. These are often 15 in. long. Paper tubes are now often used where B.s were originally employed. In lace-making and some other industries a peculiar type of metal B. is used.

Bobbio, It. tn in Emilia-Romagna (q.v.), on the Trebbia, 24 m. SW. of Piacenza (q.v.). The abbey of B., once a great centre of learning, was founded by St Columban (q.v.) in the 7th cent. Its famous library has been largely dispersed (chiefly to the Vatican, q.v.), but some of its documents still remain in the cathedral. Pop. (tn) 1800; (com.) 6500.

Bober, see BOBRWA.

Böblingen, Ger. tn in the Land of Baden-Württemberg (q.v.), standing between 2 lakes, 11 m. SW. of Stuttgart (q.v.). It has ant. walls and towers, is a mkt. tn, and has brewing and hosiery industries. Pop. 14,000.

Bobolink, name given to a N. Amer. bird of the family Icteridae. It differs from the orioles or starlings in having a long middle toe and pointed tail-feathers, and is noted for its curious song. Others of its names are rice troupial, reed-bird, skunk-bird, and rice bunting.

Bobrawa (Ger. **Bober**), riv. of Poland, which rises at the SE. foot of the Riesengebirge (q.v.), and flows NNE. past Kamienna Góra, WNW. past Jelenia Góra, and then generally NNW. past Zagan to join the Odra near Krosno (qq.v.). Length 166 m.

Bobruysk, tn on R. Berezina in the Mogilev Oblast of Belorussia. It has a timber industry. Pop. (1939) 84,000. It has been known since the 16th cent., has been Russian since 1793, and a tn since 1795; it was an important fortress until 1897. In 1944 it was the scene of a Ger. defeat. In 1944-54 it was cap. of B. Oblast, now abolished.

Bobsleigh, see TOBOGGANING.

Boc-land (from A.-S. *bōc*, a book, i.e. book-land), early Eng. method of land tenure, better described now as charter-land or deed-land. B. was folk-land which was allotted by deed to some person in private ownership by the king and council. It differs from the *ethel* (Eng. homestead), which was land cut off from the folk-land and made the perpetual possession of its owner and his descendants, and which depended on no charter for its possession. B. could be held by the king or by ecclesiastics, and less frequently by a lay subject. It was often granted in perpetuity to a church or monastery, for which it could be held in trust by a layman. During the lifetime of its owner it could be alienated or disposed of, but only by *boc*, as it had been received.

Bocage, Manuel Maria Barbosa du (1765-1805), Portuguese poet, b. Setúbal. Though from the beginning he showed a remarkable talent for versification, he entered the navy, and his adventures carried him as far as Brazil and the Indies. Before this his numerous love affairs had given plenty of scope for the exercise of his special gift, but on his

return in 1790, the style of his verse had changed to satire. He was endowed with great powers of improvisation. Though he wrote eclogues, idylls, epistles, songs, etc., it was in the sonnet that he excelled and gained a place among the best writers of this genre in Portugal. He also left a number of unfinished tragedies and some trans. His works were pub. in 8 vols. in 1875-6.

Bocage (from Lat. *boscum*, a wood), name applied to sev. dists. in France which have the same physical characteristics: cultivated fields with underwood and hedges. The Norman B., in the depts of Calvados and Orne, has its cap. at Vire. Here was some of the severest fighting in the Normandy campaign of 1944 (see WESTERN FRONT IN SECOND WORLD WAR—INVASION OF NORMANDY). The Vendean B., in the NW. of the old prov. of Poitou, was the theatre of the counter-revolutionary risings of 1793 (see VENDEE, LA; also VENDEE, RISINGS IN THE).

Bocas del Toro: 1. Prov. cap. and port of Panama, situated in the lagoon or bay of Chiriquí. The bay forms a good natural harbour and the surrounding country is fertile, producing fruits, coconuts, and india-rubber. Pop. 2900.

2. Prov. of same name. Area 3508 sq. m.; pop. 22,100.

Bocca Tigris (Portuguese form of the Chinese *Hu-men*, Tiger Gate), part of the estuary of the Canton R. On an is. in it are the Bogue forts, taken by the British in 1841 and 1856.

Boccaccio, Giovanni (1313-75), It. novelist and poet. It is generally accepted that he was the natural son of Boccaccio di Chellino da Certaldo, a Florentine merchant, and that his mother was a Fr. girl whom his father married in Paris after B.'s birth there in 1313 or 1314. B. was educ. in Florence under Giovanni da Strada, an esteemed Florentine teacher of grammar, father of the poet of the same name. As a young man he went to Naples, where he visited the tomb of Virgil, and where it seems he was a favourite with the ladies. It is thought that he there fell in love in the church of St Laurence with a young married lady named Maria d'Aquino, natural daughter of King Robert of Naples. His frequently recurring character Fiammetta, who represents Maria, has lent colour to this and to similar stories, especially as he talks of the ladies at church in his *Fiammetta* and again in his prose novel *Filocolo*, which relates what is assumed to be the story of his love. Also there is similar internal evidence in his *Teseide*, a poem in 12 books, relating to the fabulous adventures of Theseus. This latter has the merit of being the first romantic novel to appear in the It. language in *ottava rima*, a metre adopted by Tasso and Ariosto. It is from this poem that Chaucer borrowed his *Knight's Tale*, to which Dryden gave a new name, and recast it as *Palamon and Arcite*. Also in *ottava rima* is his narrative poem, *Filostrato*, the great interest of which, for the Eng. reader, lies in the fact that Chaucer, in his *Troilus and Criseyde*, boldly adopted the main features of B.'s

plot, besides literally translating parts of B.'s poem without acknowledgment of his source. In 1341 B. returned from Naples to Florence, where he applied himself to the study of astronomy and Greek. According to some, he was in Naples again in 1344, and resided there for some years, writing many of his works and frequently appearing at court. Others say he went to Sicily to improve his knowledge of Greek, but this is less probable. What seems incontrovertible is that the Florentines, who recognised his abilities, sent him on an embassy to Romagna in 1346; but he was there only a year, for, in 1348, on the news of his father's death, he returned to Florence to take up his inheritance, a



GIOVANNI BOCCACCIO

great part of which he spent in purchasing MSS. both in Greek and Latin. In 1359 he was in Milan on a visit to Petrarch (q.v.), with whom he had formed a friendship some years earlier. He subsequently established a professorship of Greek literature in Florence. In 1365 the Florentines sent him on an embassy to Pope Urban V at Avignon, and on his return appointed him one of the Florentine magistrates, an office he retained for 2 years, when he was again sent to the Pope, this time to Rome. There is no doubt that B. was strongly influenced by Petrarch; and his numerous and varied works, which show that he was an ardent exponent of the new learning, support this view. He is best known by the *Decameron*, 1348-58, a collection of 100 prose tales, supposed to have been told by courtiers and ladies in retirement during the plague at Florence in 1348. The stories, although often adapted from traditional sources, are quite original in their treatment, wit, and realism, and are a valuable document of 14th-cent. society. The influence of the *Decameron* on It. and European literature was immense. He

also wrote numerous romances and pastorals in verse and prose, and sev. Lat. treatises. He left his valuable library to his confessor Martino da Signa for life and then to the students of the convent of the Spirita Sancta, in Florence. See A. Gustarelli, *Giovanni Boccaccio* (Milan), 1929; G. R. Silber, *Influence of Dante and Petrarch on Boccaccio's Lyrics*, 1946; F. Macnannus, *Boccaccio*, 1947.

Boccage, Marie Anne Lepage, Dame Fiquet du (1710-1802), Fr. poetess, b. Rouen. A prize won at the academy there encouraged her to publish her *Paradis terrestre*, 1748, written in imitation of Milton. She went to Ferney to visit Voltaire, who praised her fulsomely, but whether the praise was sincere or not has been disputed. Her other works are *La Colomnade*, 1756, and *Letters concerning Voltaire*, 1770.

Boccassini, Trajano (1556-1613), It. satirist and political writer; governor of sev. tns of the papal states between 1608 and 1611. He was hostile to the Sp. nation, and in fact the only gov. he did not attack was that of Venice. His *Commentaries on Tacitus* is a series of discussions reviewing the various forms of gov. His prin. work is *Ragguagli di Parnaso*, 'Dispatches from Parnassus,' 1613, a satirical work dealing in a brilliant fashion with contemporary questions and personages, both private and political. The work was extremely popular throughout the 17th cent., and trans. appeared all over Europe. It was followed by a similar collection, *La pietra del paragone politico*, left unfinished at his death.

Boccanegra, Simone (fl. 1339), Genoese statesman. He was elected doge of Genoa for life in 1339, but compelled to resign in 1344, and lived in retirement at Pisa till 1356, when he was re-elected. He gained numerous victories over the Turks, Tartars, and Moors.

Boccherini, Luigi (1743-1805), It. cellist and composer, b. Lucca; he received his first lessons from his father, a double-bass player. He went to Rome in 1757 to improve his art; was back at Lucca, 1764; in Paris, 1768, and then in Madrid, where he was patronised by the king's brother, the Infante Don Luis. He was chamber composer to Frederick William II of Prussia, 1787-97; he returned to Spain, where, after another appointment and some success as a composer, he fell on evil days. He d. in Madrid. He is considered a master of chamber music, mainly for string instruments. His vocal music includes the *Stabat Mater*, a Christmas cantata, and 2 operas, one at Lucca and another, *Clementina*, at Madrid. His other compositions include a score of symphonies and vast quantities of chamber music (2 octets, 16 sextets, 155 quintets, 102 quartets, 60 trios, 6 duets, and 33 sonatas are preserved).

Bochart, Samuel (1599-1667), Fr. theologian and philologist, pastor of a church at Caen, whose *Sacred Geography*, pub. about 1630, so added to his fame that Christina of Sweden invited him to Stockholm. In 1653 he became a prof. at the new academy of Caen, a post he held till

his death. His works include *De Animalibus Sanctae Scripturae*, 1663, and *Reply to the Letters of M. de la Barre, Jesuit*, 1662.

Boche was a common army term for a German in both world wars. It originated in Parisian slang of about 1860, where it meant a rake, or generally a 'bad lot.' In the Franco-Prussian war of 1870 it was applied, by a simple transference of ideas, to the Ger. enemy, and was similarly employed in 1914 and 1939. In the world wars the term 'Hun' was equally common, being adopted especially after the Germans' wanton destruction of historic buildings in Louvain and elsewhere. The latter word was first applied to the Germans by the Kaiser himself in 1900, when in a speech to Ger. soldiers departing for China he urged them to emulate the Huns under Attila (q.v.).

Bochnia (Ger. *Salzberg*), tn of Poland, in Kraków prov., 22 m. ESE. of Kraków (q.v.). There are salt and gypsum deposits in the vicinity. Pop. 15,000.

Bocholt, Ger. tn in the *Land* of N.-Rhine-Westphalia (q.v.), 43 m. N. by W. of Düsseldorf (q.v.), near the Dutch border. It has a Renaissance tn hall and a 15th-cent. church. There are iron-founding, textile, and engineering industries. Pop. 35,000.

Bochum, Ger. tn in the *Land* of N.-Rhine-Westphalia (q.v.), in the Ruhr (q.v.) dist., 25 m. NE. of Düsseldorf (q.v.). It was very severely damaged during the Second World War. There is a fortress, a fine 16th-cent. church, a 10th-cent. church which contains splendid medieval murals, and a well-known theatre. The tn is the centre of a rich coal-mining dist., and has a school of mining and a mining museum. There are also steel, chemical, tobacco, and brewing industries. Pop. 338,700.

Book, **Fedor von** (1880-1945), Ger. soldier, b. Kustrin, son of a distinguished general; attended the Potsdam Cadet Academy, and entered the First World War as a staff officer. In 1917 he commanded an infantry battalion, winning the *pour le mérite* decoration for valour. In 1938 he reached the rank of general and commanded the armies that invaded Austria. In the Polish campaign (1939) he commanded the N. armies invading from E. Prussia. In France (1940) he directed the thrust along the lower Somme. Promoted to rank of field marshal. Commanded the armies on the central front against Marshal Timoshenko in the Ger. invasion of Russia (1941). A fanatical, harsh, typical Prussian soldier and a military ascetic, in 1942 he was relieved of his command on account of his failure to capture Stalingrad.

Bockenheim, see FRANKFURT-AM-MAIN.

Böckh, see BOECKH.

Böcking, Eduard (1802-70), Ger. lawyer, b. Trarbach. He was appointed prof. of law at Bonn in 1835, and wrote on many legal subjects. His pub. works include *Notitia Dignitatum Utriusque Imperii* (in 5 vols.), 1839-50, and *Institutiones des Römischen Privatrechts*.

Bocking, vil. of Essex, England, † m.

NE. of Braintree (q.v.), on the R. Blackwater, in Braintree urb. dist. B. has an interesting church, largely Perpendicular but dating from 1606.

Böckingen, Germany, in Württemberg-Baden, a suburb of the city of Heilbronn (q.v.).

Böcklin, Arnold (1827-1901), Swiss painter, son of a silk-worker at Basel. He studied in Düsseldorf, Brussels, and Paris, and afterwards lived for some years in Rome, where he married. In 1856 he went to Munich, where his first great success, 'Pan amongst the Reeds', was exhibited and bought for the Pinakothek. This and other mythological pictures gained him a great reputation. His weirdly imaginative art is perhaps seen to best advantage in his 'The Isle of the Dead' (Basel). He d. at San Domenico, near Florence. See studies by W. Ritter, 1895, H. Brockhaus, 1901, and J. Meier-Graefe, 1905.

Bocskay, Stephen (1556-1606), Prince of Transylvania. He was the leader of a successful rebellion against the Emperor Rudolf II in 1604, and in 1605 was elected Prince of Transylvania by the Hungarian diet. Two years later a peace was concluded with the Archduke Matthias, granting freedom of religious worship to the Protestants of Hungary.

Bodaybo, tn in Irkutsk Oblast of S. Siberia, on R. Vitim, 1120 m. NE. of Irkutsk. Centre of the rich B. (or Vitim, or Lena) gold-mining area. Founded 1863, tn 1903. Near B. in 1912 a workers' strike procession was shot at by troops, causing many casualties.

Boddam, coastal par. 3 m. S. of Peterhead, Aberdeenshire, Scotland, an agric. dist. with granite quarrying and fishing. Pop. 1000.

Boddie, see BODLE.

Bode, Johann Elert (1747-1826), Ger. astronomer, b. Hamburg. In 1772 he was made astronomer of the academy at Berlin, and from 1786 to 1825 was director of the observatory there. His name is best known as the propounder of B.'s law, on the proportion of the respective distances of the planets from the sun. The law states that the proportionate distances of the planets from the sun are found by adding 4 to each term of the series 0, 3, 6, 12, 24, etc., which, omitting the first term, forms a geometric series with 772 as last term. When he first advanced this rule, which still remains empirical, it was found that a planet should occur between Mars and Jupiter, and a group was subsequently (1801) discovered there. The rule, then, holds good, excepting its application to Neptune and Pluto whose distances from the sun are less than B.'s law requires.

Bode, Wilhelm von (1845-1929), Ger. art expert. He founded the dept of Christian sculpture, Berlin, 1883, and later became director of the Prussian museums. He figured in a dispute over the genuineness of a bust he bought for the museums and which he asserted to be the work of Da Vinci. His reputation, however, did not suffer from this error, for he was considered in other countries

besides his own to be the best living authority on old masters. He continued as director of Prussian museums under the rep. till 1920, when he retired to take up the less onerous duties of curator in the Kaiser Friedrich Museum.

Bodegas, see **LABAHOYO**.

Bodenbach, see **PODMOKLY**.

Bodensee, see **CONSTANCE, LAKE**.

Bodenstedt, Friedrich Martin von (1819-1892), Ger. poet, b. Poine, Hanover. In 1840 he became tutor to the family of Prince Galitzin in Moscow, and after 4 years went to Tiflis, where he studied Persian literature. From this sprang the most popular of his works, *Die Lieder des Mirza Schaffy*, 1851, a vol. of original poetry which purported to be trans. from an E. work. Its success in Germany was enormous. In 1854 he was made prof. of the Slav languages at Munich. In 1858 he gave up this post and took the chair of O.E. language and literature. During the years that followed, he pub. a trans. of the complete works of Shakespeare (1866-1872), and sev. other valuable works on Eng. literature.

Bodetalsperre, see **BLANKENBURG**.

Bodh-Gaya, see **BUDDH-GAYA**.

Bodiam, vil. of E. Sussex, England, on the R. Rother, 14 m. from Hastings. Here is B. Castle, built in 1386, the last castle to be constructed in England. Outwardly well preserved, the castle has 4 round towers, a barbican, gateway, portcullis, and a moat. It was presented to the nation by the Marquess Curzon in 1926. B. has large hop gardens. Pop. 308.

Bodichon, Barbara Leigh, née Smith (1827-90), educationist, b. Watlington, Norfolk. A strong advocate of women's rights, she took much interest in univ. education for women, being one of the founders of Girton College. She was also a talented painter of landscapes in water-colour.

Bodin, Jean (1530-90), Fr. philosopher and economist, b. Angers. Having studied law at Toulouse, he became prof. of jurisprudence at that univ., until in 1561 he came to Paris to secure the favour of the king. Before this he had trans. Oppian's *Cynegeticon* into Lat. verse with a commentary. In 1576 he was made king's advocate at Laon, and in the same year he was elected by the *tiers état* of Vermandois as its delegate to the States-General of Blois. In this assembly he defended the rights of the people against all restrictions, whether imposed by king, clergy, or nobility. In 1581 he visited England as secretary to the Duc d'Alençon, when the duke was seeking the hand of Queen Elizabeth. The remainder of his life was spent at Laon, where his influence was such that he persuaded the citizens to declare for the League in 1589 and for Henry IV in 1594. He d. of the plague. His greatest work was *Les six livres de la République*, 1576, the first important attempt in modern times to construct a complete system of political science. He also wrote a curious work on sorcery entitled *De la démonomanie des sorciers*, 1580. See R. Chauvire, *Jean Bodin*, 1914; B. Reynolds, *Proponents of Limited Monarchy*, etc., 1931.

Bodishat, see **BARLAAM AND JOSAPHEAT**.
Bodie, or **Boddie**, anct. Scottish copper coin of time of Charles II, worth about one-sixth of an Eng. penny. Its name is said to be derived from Bothwell the mint master. The word only survives in the phrase 'not to care a bodie.'

Bodleian Library, univ. library of Oxford. The original univ. library, based on the collection of Humphrey, Duke of Gloucester (d. 1447), was re-formed and enlarged in 1598 by the addition of Sir Thomas Bodley's library which had been given to him by the Earl of Essex. This priceless library had originally belonged to Bishop Jerome Osorius of Faro, and had been seized by Essex while on an expedition to Cadiz. Sir Thomas Bodley (q.v.), by a private transaction in 1610 with the Stationers' Co., arranged for the gift to the library of a free copy of every new book printed by members of the company. This agreement became law in 1662 (see **COPYRIGHT LIBRARIES**) so that the B. L. has enjoyed for 50 years longer than any other library the right to a copy of every new book pub. in England, and now contains over two million vols. The library is excelled by few in Europe, and its oriental MSS. are probably unsurpassed in the world. The Radcliffe Camera originally housed in 1749 the Radcliffe Library of Physics. In 1860 this library was removed and the Camera became a reading-room for the B. L. An extension of the library has been built in Broad Street, connected with the main library by a tunnel.

Bodley, George Frederick, R.A. (1827-1907), architect, b. Hull. Pupil of Sir Gilbert Scott, he achieved the reputation of being the chief Eng. reviver of 14th-cent. Gothic. His work includes new buildings at Magdalen and Univ. Colleges, Oxford; Queen's College Chapel, and a new block at King's College, Cambridge; Marlborough College Chapel; Holy Trinity, Kensington; Eton Mission Church, Hackney Wick; churches at Eccleston, Hoar Cross, Pendlebury, etc.; and the London School Board offices. In collaboration with James Vaughan he designed the cathedral at Washington (dist. of Columbia) and the cathedrals at San Francisco and in Tasmania.

Bodley, John Edward Courtenay (1853-1925), historian, educ. at Balliol College, Oxford. He was called to the Bar in 1874. He was a corresponding member of the Fr. Institute, and wrote a number of books on France. The most important is in 2 vols.: vol. i, *The Revolution and Modern France*; vol. ii, *The Parliamentary System*, 1898. Other books are *L'Anglo-manie et les traditions françaises*, 1899, *The Church in France*, 1906, *L'Âge mécanique et le déclin de l'idéalisme en France*, 1913, *The Romance of the Battle Line in France*, 1920, also *The Coronation of Edward VII*, written by His Majesty's command in 1903. See memoir by S. Leslie, 1930.

Bodley, Sir Thomas (1545-1613), diplomatist, b. Exeter, educ. at Geneva and Magdalen College, Oxford. He became a fellow of Merton College, and in the years

between 1580 and 1597 he was employed in various embassies to European countries. He returned home in 1597, and spent the rest of his life in restoring and augmenting Duke Humphrey's library at Oxford, which was later named after him. He was knighted at the accession of James I. He bequeathed almost all his possessions to the library. See BODLEIAN LIBRARY.

Bodmer, Johann Jakob (1698-1783), Swiss poet and man of letters. He was prof. of hist. at Zürich from 1725 to 1775. He founded a weekly critical periodical, which aimed at freeing literature from the shackles of pedantry. He did much by his contributions as a journalist and critic to create a Ger. national literature free from foreign influences. After his *Abhandlung vom Wunderbaren*, 1740, a literary controversy started between B. and Gottsched, which lasted for many years. B.'s works include *Noachide*, 1752, an indifferent epic poem in 12 cantos; a prose trans. of *Paradise Lost*, and eds. of Old Ger. texts. See M. Wehrli, *Bodmer und die Geschichte der Literatur*, 1936.

Bodmin, co. tn of Cornwall, 30 m. WNW. of Plymouth, England. It has some trade in agric. produce, and has numerous relics, including Rom. remains. Pop. 5849.

Bodo (Bodö), coastal tn of N. Norway, situated almost opposite the S. extremity of the Lofoten Is., co. tn of Nordland. 420 of B.'s 760 houses were destroyed by Ger. bombardment on 27 May 1940. B., now rebuilt, is a busy port. Pop. 9700.

Bodoni, Giambattista (1740-1813), It., printer, the son of a printer of Saluzzo, in Piedmont. In 1758 he went to Rome and was employed as compositor in the printing office of the Propaganda. In 1768 he was made head of the ducal printing house in Parma, whence he sent out some beautiful eds. of Gk, Lat., Fr., and It. classics. The works from his press are among the best examples known of It. typography, and are eagerly sought after by collectors.

Bod-pu, see TIBET.

Bödcher, Ludwig Adolph (1793-1874), Dan. poet, b. Copenhagen, and educ. there. He was for some time secretary to the sculptor Thorwaldsen. His poems are chiefly love-songs, but all are remarkable for delicacy and finish. His philosophy was that of the epicurean and quietist. See G. Brandes, 'L. Bödcher' in *Samlede Skrifter* II, 1905.

Böðvarson, Guðmundur (1904-), Icelandic poet. His poems are of uneven quality, but he is in the front rank of his contemporaries.

Body Cavity, term used in embryology to denote that portion of the embryo which ultimately develops into the pleural, pericardial, and peritoneal cavities, that is to say, those portions bounded by the membranes enclosing the lungs, heart, and abdomen. The ovum after fertilisation divides up into a number of cells. A cavity called the segmentation cavity then appears; an outer layer of cells, the *ectoderm*, and an inner layer, the

endoderm, are differentiated. Then there is estab. a linear streak called the *primitive streak*, consisting of thickened *ectoderm*. The *mesoderm* or middle layer then develops between *ectoderm* and *endoderm*. The *mesoderm* gradually extends over the whole of the ovum, separating the *endoderm* from the *ectoderm*, but in most mammals a cleavage appears in the *mesoderm*, which ultimately develops into the *coelom*, or B. C. In other forms the *coelom* represents the segmentation cavity. The embryonic area then develops folds at head and tail, and attains a crescent formation, the *endoderm* being represented by the yolk-sac and primitive alimentary canal held between the horns of the crescent, and the body cavity forming the body of the crescent.

Body Snatching, Body Snatchers. See RESURRECTIONISTS, or RESURRECTION MEN.

Boece, Boeis, Boyce, or Boethius, Hector (c. 1465-c. 1536), historian, b. Dundee. He received his education at Dundee and at Paris Univ. Vacating the chair of philosophy in the college of Montaigne, he was in 1500 appointed by Bishop Elphinstone to the first principalship and professorship of divinity of King's College, Aberdeen. B.'s first work, which included an account of Bishop Elphinstone, was entitled *Episcoporum Murthlacensium et Aberdonensium Vitae*, 1522. In 1527 he received from the king a pension of £50 Scots yearly. Later, when he was appointed rector of Tyrie, that pension was altered to a yearly 100 marks Scots. This he enjoyed until his death, when he was buried beside Elphinstone. He had been made doctor of divinity (Aberdeen) in 1528. He is remembered for his famous hist. of Scotland, *Scotorum Historia ab illius gentis origine*, first pub. in 17 books in Paris in 1527, and by order of James V trans. into the Scottish language by John Bellenden (pub. 1536). Wm Harrison pub. an Eng. trans. in 1577. The hist. begins with a geographical description of the country, and contains much fabulous and legendary material, including the story of Macbeth, later borrowed by Holinshed, in whose *Chronicle* Shakespeare read it.

Boeckh, Philipp August (1785-1867), Ger. philologist and antiquary, b. Karlsruhe; studied at the univ. of Halle, where as a student under Wolf he developed his philological bent. In 1807 he became prof. of philology at Heidelberg, and in 1811 he was transferred to the univ. of Berlin. His works include a monumental ed. of Pindar, 1811-21, and the first 2 vols. of the *Corpus Inscriptionum Graecarum*. See J. F. Sandys, *History of Classical Scholarship* (3rd ed.), 1921.

Boecklin, Arnold, see BÖCKLIN.

Boehm, Sir Joseph Edgar (1834-90), sculptor, b. Vienna, of Hungarian parentage. He settled in England as a moulder of coins and medals, and his work was attended with such success that he turned his whole attention to sculpture. In 1869

he executed the colossal statue of Queen Victoria for Windsor Castle, and after that time a succession of noble patrons charged him with commissions. In 1878 he was made A.R.A., and in 1881 was nominated sculptor in ordinary to the queen. In 1882 he became R.A. The effigy of the queen on the jubilee coinage of 1887 was designed by him.

Boehme, Jakob (1575-1624), Ger. mystical writer, b. near Görlitz in Upper Lusatia. He received practically no education. At about the age of 14 he was apprenticed to a shoemaker, and he remained in this trade for some considerable time. He was never possessed of much wealth, and the greater part of his life was spent in one long struggle with poverty. His first written work was the *Aurora*, a work of revelation and meditation; of the nature of God and man. The book was eagerly read, and created a considerable sensation, so much so that he was forced to appear before the local council, who confiscated his book and told him to write no more. For the next 6 years he was silent, but at the end of that time he again began to write on such subjects as repentance and resignation. In 1624 he was summoned to Dresden, where he was well received. He still, however, had to face clerical opposition. He and his chief opponent, Richter, d. within a few months of one another. His main aim in the writing of his great work *Aurora* was to attempt to explain the origin of things. His philosophy can be largely called the philosophy of contradiction. The *Unground*, or *Urground*, was the source of everything—love and sorrow, heaven and hell, sweet and bitter, and his conception of God made the Deity the beginning and source of everything rather than the goal to which the ideals of the theologian was to attain. His name is often quoted in England as Behmen, and during the 17th cent. his works were very extensively studied. See R. H. Betterling, *The Illuminate of Goerlitz or J. Böhme's Life and Philosophy*, 1923.

Boehmeria (*Boehmeria nivea*), species of Urticaceae which is a native of China and Japan. It is valuable in commerce for its long and strong bast fibres which are woven into the durable material known as grass-cloth, rhea, or ramie.

Boëllmann, Léon (1862-97), Fr. organist and composer, b. Alsace. Trained as an organist under Gigout, a teacher of church music in Paris. Appointed organist of the church of St Vincent de Paul. His *Gothic Suite* is well known, as also are his *Symphonic Variations* for cello and orchestra.

Boeotia, anct political div. of Greece between Locris and Phocis on the N., and Attica and Megara on the S. The earliest inhab. were the Minyae; they were driven out by the Boeotians, who were of Aeolian race and came from Thessaly. The prin. pursuits of the Boeotians were agric. As compared with other Greeks they were considered rough and boorish. This fact led to the term Boeotian being used as a synonym for ignorant, unlettered stupidity, despite the names of Hesiod, Pindar,

and Corinna, all of whom came from B. The dist. was divided into 5 main divs.: the basin of Lake Copais, that of Asopus, the plain of Thebes, the coast dist. of the Euboean Gulf, and that of the Corinthian Gulf. The prin. riv. was in anct times known as the Cephissus (q.v.). Formerly the Boeotian League numbered 14 great cities with Thebes at its head.

Boer Wars: 1. The war between the Brit. and the Boers of the Transvaal, S. Africa, in 1880-1, occasioned by the proclamation of the Transvaal as a rep. The most notable event of the war was the defeat of the British at Majuba Hill in 1881. Peace was made shortly afterwards, Great Britain recognising the independence of the Transvaal.

2. The war between Great Britain on the one side and the Transvaal Rep. and the Orange Free State on the other, in 1899-1902. The British at first suffered reverses, and Brit. troops were hemmed in at Ladysmith, Kimberley, and Mafeking. All 3 were ultimately relieved, the length of the sieges being: Ladysmith, 29 Oct. 1899 to 28 Feb. 1900; Kimberley, 14 Oct. 1899 to 15 Feb. 1900; Mafeking, 15 Oct. 1899 to 16 May 1900. Pretoria, the cap. of the Transvaal, was occupied by the Brit. troops under Lord Roberts on 5 June 1900. Peace was signed on 31 May 1902. The conquered countries were given self-gov., and in 1909 they were included in the Union of S. Africa by the Act of Union in that year. For details see SOUTH AFRICA, THE UNION OF.

Boerhaave, Hermann (1668-1738), Dutch physician, b. Voorhout near Leyden. In 1690 he took his philosophical degree at Leyden, and in 1693 his medical degree. He was appointed lecturer on the theory of medicine at Leyden in 1701, prof. of medicine and botany in 1709, and prof. of chem. in 1718. He was renowned throughout Europe as physician and teacher; he had a lasting influence on medicine, and the methods of instruction he introduced at Leyden became a model for Europe, the foundation of modern clinical teaching. His works include *Institutiones Medicae*, 1708, and *Aphorismi de Cognoscendis et Curandis Morbis*, 1709.

Boers (from Dutch *boer*, farmer, husbandman; cf. Eng. *boor*), name given to the Dutch settlers in S. Africa. They began to settle there in the 17th cent. and were augmented by some 200 Fr. Huguenots in 1688 and succeeding years, and later by Germans.

Boethius, Anicius Manlius Torquatus Severinus (c. 480-c. 524), Rom. philosopher and statesman, b. Rome, of a distinguished family, he received a liberal education and soon became noted for his learning, especially in Greek. He is described by Gibbon as 'the last of the Romans whom Cato or Tully could have acknowledged for their countrymen.' In 510 he became consul, and later chief of the senate. In 500 the seat of gov. of Theodoric, King of the Goths, had been fixed at Rome, and B., who had gained his confidence, was appointed *magister officiorum* in his court. He lost the favour

of Theodoric, however, by his firm stand for the rights of the Romans against the tyrannical rule of Gothic officials, and in particular by his defence of Albinus and Symmachus, who had made an attempt to assert Rom. independence. B. was accused of treason, degraded from his dignities, despoiled of his property, and after a long imprisonment at Pavia, executed by the king's command. While in captivity he produced his great work *De Consolatione Philosophiae*, which takes the form of a dialogue between the writer and Philosophy, the latter teaching the mutability of all things save virtue. This famous work is an imitation of a similar work by Marcius Capella, *De Nuptiis Philologiae et Mercurii*. Its style is based on the best Augustan models, and the prose conversation is interspersed with verse passages. While the religious tone of this work is decidedly theistic, it contains no reference to Christianity, which fact, together with the doubtful authenticity of the *De Fide Catholica* attributed to B., rather militates against the medieval canonisation of him as a Christian saint. *De Consolatione* was popular in the Middle Ages, and was trans. into A.-S. by Alfred the Great, and into English by Chaucer, and also by Queen Elizabeth I. The influence of B.'s philosophy is to be seen in much medieval literature, notably in the Fr. romance, *Le Roman de la Rose*, and Chaucer's *Troilus and Criseyde* and *The Knight's Tale*. B. trans. into Latin Aristotle's *Categorias* and *Peri Hermeneias*, and it was long supposed that he also trans. the *Analytica Priora et Posteriora*, *Topica*, and *Elenchi Sophistici*; but these latter trans., like so much that was once attributed to B., are now regarded as spurious. He wrote a series of independent works on logic, manuals of arithmetic, astronomy, geometry, and music, which were largely used. His complete works have been sev. times pub., the last ed. being at Paris in 1860. See H. R. Patch, *The Tradition of Boethius: his Importance in Medieval Culture*, 1935.

Boethius, Hector, see BOECE, HECTOR.

Boston, see BOSTON.

Bofors Gun, automatic anti-aircraft gun of Swedish origin developed between 1920 and 1935 and introduced into Brit. and Amer. service at the beginning of the Second World War. Of 40 mm. calibre, it has a rate of fire of 90 rounds a min.

Bog, see BUG.

Bog, land which has become soft and spongy, from the presence of too much water. Generally it is partially composed of decomposing vegetable matter, and in this form it is common in N. countries, and particularly in Ireland. Here the B.s are sufficiently firm to bear considerable weight, and compaction below the surface forms the vegetable matter into peat, which is cut out and used both for fuel and in the composition of manures. It is estimated that over 2,000,000 ac. of the surface of Ireland are thus occupied. The greatest B. in the Brit. Is. is the B. of Allen, lying to the E. of the Shannon, chiefly in co. Kildare, Rep. of Ireland.

The name is given to a collection of B.s, separate, but grouped together as the B. of Allen. B.s, which may be from 20 to 40 ft in thickness often prove a serious menace to the prosperity of the surrounding land, for in the event of a 'B. burst' the neighbourhood may be swamped with water and covered with a deposit of peat. The surface of the Irish B.s is covered with fine green turf, and the roots are so matted together that a man may walk over them in safety provided he is accustomed to doing so. The surface is not generally level, but is usually uneven, sometimes swelling up into mounds. This gives facility for drainage, of which advantage is now being taken. In England, Chat Moss, in Lancs, is a B. which has been largely filled up, and Solway Moss should also be named.

Bog Asphodel (*Narthecium ossifragum*), species of Liliaceae, common in boggy ground throughout Britain. It has yellow flowers, a sympodial rhizome, and loculicidal capsule.

Bog Butter, fatty substance which has been discovered in peat-bogs of Ireland and Scotland, and is known technically as butyrellite. It is a form of adipocere.

Bog Iron Ore, mineral formed from deposits of limonite often found in bogs, lakes, and meadows. In composition it may be compact or spongy, and in colour it is either blackish-brown or yellowish-brown. The iron which it yields is of good quality, but there is usually little of it, and it is often mixed with sand and clay. It is found abundantly in the lakes of Norway and Sweden, in N. America, and in some parts of Scotland.

Bog Moss, or Peat Moss, see SPHAGNUM.

Bog Myrtle, or Sweet Gale (*Myrica gale*), plant which grows abundantly in bogs of Britain, especially in the highlands of Scotland. The leaves emit a fragrant odour when crushed. It bears male and female catkins, and the fruit is a wax-secreting nut.

Bog Oak, hard, black wood found in bogs, indicating that forests once flourished in the present marshy ground. In Ireland it is used for the manuf. of ornaments. The action of the antiseptic water preserves the oak well, but at the same time renders it difficult of manipulation in carving.

Bog-pimpernel, see PIMPERNEL.

Bog Plants, various plants which grow in bogs. The soil in which they grow often contains rich food materials, but is not sufficiently aerated, so that the plants cannot form nitrates; sev. of these plants, therefore, e.g. the sundew and butterwort, are carnivorous, and obtain their nitrogen from insects which they devour. Again, the water is deficient in lime and other salts, and the plants are stunted, unlike their neighbours in the marshes. Water absorption is rendered difficult by the peaty acids of the bog, and many plants have therefore the characteristics of xerophytes. Agriculture will not tolerate the soil necessary for them, and the consequent drainage of the land usually kills the plants. Many of them are extremely

beautiful, and for this reason they are grown under artificial conditions planted in gardens, in a soil composed of peaty substances and bog-mould; they receive a plentiful daily supply of water. Under their various headings the chief B. P. are discussed. From the great variety of these plants the following may be chosen as examples: bladderwort, butterwort, bilberry, bog asphodel, bog bean, bog cinquefoil, bog orchid, bog myrtle, bog pimpernel, heather, ling, grass of Parnassus, meadowsweet, marsh-marigold, lousewort, rushes of different kinds with sedges and grasses, sundew, and yellow rattle.

Bog Spavin, see *HORSE, Diseases*.
Bogardus, James (1800-74), Amer. inventor, b. New York. He was brought up to the business of a watchmaker. He invented the dry gas-meter, a pyrometer, a sounding machine for use in deep sea, a dynamometer, etc. In 1839 the Brit. Gov. accepted his method for the manuf. of postage stamps.

Bogart, Humphrey (1899-1957), Amer. actor, b. New York City; educ. at Andover Academy. He served in the U.S. Navy in the First World War; afterwards he was a brokerage house messenger, and worked with Wm A. Brady as handyman, assistant stage manager, casting director, and production manager. He made his stage debut in *Smiffy*, and after a series of plays entered motion pictures in 1932. He made his name with a series of gangster roles, e.g. in *The Petrified Forest*. Later, however, he widened his range considerably and played more sympathetic roles. Probably his best-known films were *Treasure of Sierra Madre* and *The African Queen*, his performance in the latter film winning him the Academy Award for the best actor of 1951.

Bogatzky, Karl Heinrich von (1690-1774), Ger. divine, studied theology at Jena and Halle (1715-18). Wrote *Guldenes Schatzkästlein der Kinder Gottes*, 1798, reissued repeatedly.

Bogdanov (real name Malinovskiy), **Aleksandr Aleksandrovich** (1873-1928), Russian philosopher, sociologist, economist, and politician. A Social Democrat from the 1890's, he became a Bolshevik in 1903, and was the leader (together with Lenin) of the 'stone-hard' Bolsheviks and of the whole Bolshevik faction 1904-9, then leader of the Left Bolshevik 'Vpered' ('Forward') group. He was a military surgeon during the First World War; after 1917 he was outside the Bolshevik party but exercised strong influence as a theorist of 'proletarian culture' (see PROLETARIAT). From 1923 he devoted himself to the problem of blood transfusion, and he d. after an experiment on himself. B. was greatly influenced by Mach and Avenarius, and his system of Empiricism is an attempt at a synthesis of Marxism and Empiricism; his Tectology, or 'universal organisational science,' was an extension of Empiricism into the field of sociology. His text-books were standard works on Marxist economics in Russia.

Bogdanovich in a wide sense is a

'modernist' trend in Bolshevism which existed until the early 1930's and was aimed at sustaining Marxism by propping it up and supplementing it with modern ideas. B. himself performed this in epistemology and sociology, Berman in logic, S. Vol'skiy in ethics, Shulyatkov in aesthetics, Gor'kiy and Lunacharskiy in the theory of religion, Pokrovsky in historiography, Blonskiy in the theory of education, Gastev and Kerzhentsev in the scientific organisation of labour, and Kollontay in the theory of sex relations and family. All these theories were very influential among Russian Communists until suppressed by Stalin.

Bogdanovich, Prince, see *BARCLAY DE TOLLY*.

Bögh, Erik (1822-99), Dan. poet and dramatist, b. Copenhagen. He gave up his work as teacher to become an actor and later director of the Kasino theatre. He wrote over 100 plays, mostly comedies and vaudevilles, which gained great success. His light, technically skilful verse was also very popular. His dramatic works were pub. in 7 vols. (1858-70).

Boghaz Keui, vil. of Asia Minor, in the il of Ankara, Turkey. The heights which overlook the vil. are crowned by the ruins of an ant. Persian city, generally identified with Pteria, which Croesus destroyed after crossing the Halys (see Herodotus, i. 76). Parts of the rocks are covered with sculptures, whose prin. scene shows the Persian king in a triumphal entry. It is composed of 60 figures, some of which are colossal. The rocks have been levelled by hand, though they naturally form a ring round the ruins. From cuneiform tablets discovered in the first decade of the present cent. it would appear that when the Hittite empire incorporated all or most of central Asia Minor, Cappadocia, and Syria, B. K. was the seat of authority.

Boghead Coal, or **Torbanite**, bituminous substance found near Bathgate in Scotland. It is dark brown in colour, and somewhat of the nature of cannel coal. It contains a large amount of volatile substance, and consequently is largely used in making paraffin and gas.

Bogie, name given to the framework supporting the front portion of a locomotive engine or railway carriage. The B. is pivoted to the frame of the engine or wagon, and has usually 2 pairs of wheels. By reason of the freedom of action given by the pivot, the strain and jolting caused when taking curves is greatly lessened, and the danger of the train leaving the rails reduced.

Bognor Regis, watering-place in Sussex, in the parl. div. of Chichester. The tn is well equipped with the seaside requirements, and possesses a 16th-cent. church at Bersted. By its affix of Regis it commemorates the tribute paid to it by King George V.'s physicians in selecting it for their patient's convalescence in 1929. Pop. of urban dist. 24,862.

Bogo, or **Bago**, tn on the NE. coast of the is. of Cebu, in the Philippine Is. There is a good harbour, and the

surrounding country is fertile. Pop. 26,132.

Bogomils (Slavonic, 'beloved of God'), Manichaean sect founded in Phrygia in the early 11th cent. by a monk named Tzourillas, which spread to Thrace, Bulgaria, and Macedonia, being first mentioned in Europe at Philippopolis in 1115. Alexius Comnenus obtained a full knowledge of their doctrine from their leader, the monk Basil, and then burned him in 1118. The sect survived, however, until the Muslim conquest of the Balkans in the 16th cent. The B. held that God created Satanall and Christ; Satanall rebelled and created earth and human kind, though God himself gave life to these new beings. Christ received from Mary the semblance of man, and conquered Satanall, who became known as Satan. The B. condemned marriage, forbade the eating of meat, and rejected images; held baptism as purely spiritual, and denied the real presence in the eucharist. See CATHARISTS. See also J. Heard, *Russian Church and Russian Dissent*, 1887, and M. Jugie, 'Bogomiles' in *Dictionnaire de Spiritualité*, 1937.

Bogong, int peak in Victoria, Australia, altitude 6508 ft; also the name of a model tn built by the State Electricity Commission for employees on the Kiewa hydro-electric project.

Bogor, formerly *Buitenzorg*, tn and summer resort in W. Java, Indonesia, 36 m. S. from Jakarta. It has a particularly fine climate. There are famous botanic gardens. Pop. 65,000.

Bogorodsk, see NOGINSK.

Bogotá, originally *Santa Fé de Bogotá*, city, cap. of the prov. of Cundinamarca and of the rep. of Colombia, situated on a fertile plateau 8660 ft above sea level, some 200 m. from the coast. Remote and famous, B. is a picturesque tn, and its Sp.-colonial character is stamped on its streets and plazas and in contrast there are a number of modern buildings. Its topographical situation is most pleasing, for its surroundings are watered by many lakes and streams, one of which passes through the city and plunges over the edge of the plateau at Tequendama in a cascade over 500 ft high; while from the sloping plain on which it stands rise 2 lofty mts, La Guadalupe and Monserrate, both crowned with imposing churches. The view from the summit of the latter mt., reached by funicular, is famous. It was founded by Gonzalo Ximénes de Quesada, a native of Santa Fé near Granada, in 1538, and became a bishopric in 1561, cap. of the viceroyalty of New Granada in 1598. After the declaration of independence it was finally taken by Bolívar in 1819, and became the seat of gov. of Colombia in 1831. The city is traversed by the R.s San Francisco and San Agustín, and has regular, well-paved streets crossing at right angles. The chief street, the Calle de la República, leads to the square, the Plaza de la Constitución, in which are the palace of the president, the custom-house with other gov. buildings, and the beautiful cathedral; in the centre of the plaza is a

statue of Bolívar. The Capitolio, the building occupied by the Legislature, is a spacious handsome structure. Among its features of historic interest is the marble tablet on its façade inscribed with gold letters, in memory of the Brit. Legion, the English and Irish, who aided Bolívar and Colombia to throw off the Sp. yoke. As B. is subject to earthquakes the houses are made of strong material; the tn is noted for its numerous churches. It contains also a bull-ring, the Universidad Nacional de Colombia, a museum, public library, observatory, 4 colleges of univ. status, and a military academy. Within the dist. are valuable mines and good pasture land. The manufs. are of importance, and it is the emporium for trade with the interior. Pop. 700,000.

Bohain, Fr. tn in the dept of Aisne, scene of a Ger. defeat in Oct. 1918. Household and fancy goods are manuf. Pop. 5600.

Bohea, kind of black China tea, so called from Wu-i, the name of the hilly dist. where it is grown. In the 18th cent. the word B. was in general use, but to-day is used for a poorer leaf.

Bohemia (Czech, *Čechy*; Ger. *Böhmen*), ter. of Czechoslovakia, the W. part of the rep. Until 1948 it was a prov. (area 20,102 sq. m., cap. Prague), but it is now divided into the administrative regions (*kraje*) of Prague, České Budějovice, Plzeň, Karlovy Vary, Ústí nad Labem, Liberec, Hradec Králové, Pardubice, and (part of) Jihlava (q.v.).

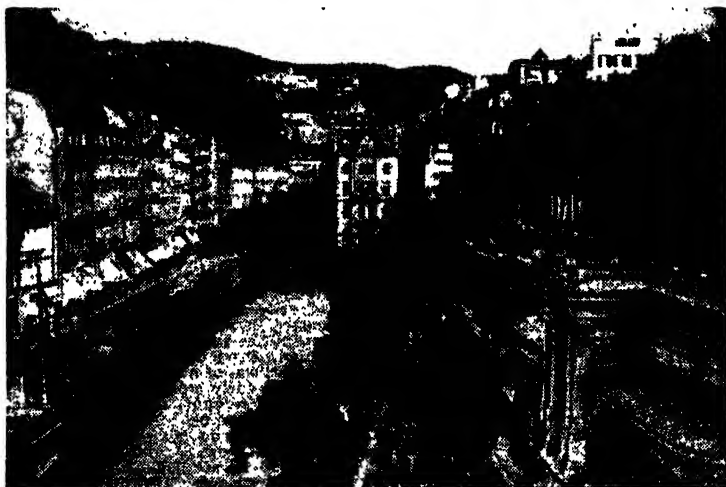
B. is almost completely enclosed by mts; in the NE. the Sudetic Mts (q.v.) form the boundary with Silesia (q.v.); in the NW. the Erzgebirge (q.v.) forms the boundary with Saxony (q.v.); in the SW. the Forest of Bohemia (q.v.) forms the boundary with Bavaria (q.v.); and in the E. the Moravian plateau joins B. to Moravia (q.v.). A series of terraces and plateaux, traversed S.-N. by the Vltava (q.v.), slope down from the Forest of Bohemia to the fertile basin of the Labe (see ELBE) in the N. Other rivs. of importance are the Ohře (q.v.) and the Berounka.

B. is largely composed of Azoic and Palaeozoic rocks of great antiquity; there are also marine deposits of the Triassic and Cretaceous ages, whilst outflows of volcanic material are found. About a third of the surface is forested, and some valuable timber is produced. The country is famous for its mineral springs, of which the best known are the chalybeate springs of Mariánské Lázně and Františkovy Lázně (q.v.), the warm alkaline springs of Teplice (where there are also sulphurous springs) and Karlovy Vary (q.v.), and the bitter cathartic springs of Sedlitz (see MOST). B. is rich also in industrial minerals, including uranium (Jáchymov, q.v.), coal and lignite (Kladno and Plzeň, q.v.), iron (Plzeň), lead and zinc (Příbram, q.v.), and copper, antimony, tin, and graphite. There are important metallurgical textile (Liberec, q.v.), chemical (Děčín and Kolín, q.v.), engineering (Plzeň), glass, brewing (Plzeň),

paper, leather, and sugar-refining industries. Agriculture has been well developed; in the higher regions potatoes, oats, and sugar-beet are grown, while in the fertile riv. valleys fruit is also grown in large quantities.

History. The name B. is derived from that of the Boii (q.v.), the first known inhab. of the country. The Boii are said to have been vanquished by the Marcomanni (q.v.) shortly before the beginning of the Christian era, and in the 5th cent. the country was occupied by the Czechs (q.v.). Christianity was introduced into B. from Moravia in the

Emperor, Rudolf I (q.v.), as feuds of the empire, and Ottakar was defeated and killed at the battle of Marchfeld (q.v.) in 1278. During the reign of his son, Wenceslas II (1271-1305), B. enjoyed great prosperity. The Premyslide dynasty came to an end upon the assassination of Wenceslas III in 1306. Then Rudolf of Hapsburg and Henry of Carinthia ruled for a short time. In 1310 the Bohemians chose as their king John (see JOHN OF BOHEMIA), the son of the Ger. emperor. John was killed at Crécy (q.v.) in 1346, and was succeeded by his son, who became Ger. emperor as Charles



CARLSBAD (KARLOVY VARY)

Czech Embassy

9th cent. after the baptism of the Bohemian Prince Bořivoj by Methodius (see CYRIL and METHODIUS), and later in the same cent. B. became part of the short-lived Great Moravian kingdom of Sviatopluk (see MORAVIA). The Czech rulers belonged to the Premyslide dynasty, the greatest of whose members at this period was St Wenceslas (q.v.). Wenceslas was slain by his brother, Boleslav I, in 929. Boleslav II extended his rule into Moravia and parts of Silesia and Poland, but these foreign possessions were lost by Boleslav III, who was finally dethroned in favour of the Polish prince, Vladivoj, brother of Boleslav the Great (see POLAND, *History*). On the death of Vladivoj, the Premyslide dynasty was restored, and in 1029 Moravia was again incorporated with B. In 1198 Premysl Ottakar I was crowned King of B. He was succeeded in 1230 by Wenceslas I, whose son, Premysl Ottakar II, extended the Bohemian dominions to the Adriatic. Most of Ottakar's possessions were claimed by the Holy Rom.

IV (q.v.) in 1348. Charles ruled over the empire from Prague, founded the univ. of Prague and Vienna, and issued in 1356 the 'Golden Bull' (q.v.) regulating imperial elections. Charles's daughter, Anne, married Richard II (q.v.) of England. On Charles's death in 1378 his son, Wenceslas IV, succeeded him as King of B. and Ger. emperor. About this time the doctrines of Wycliffe (q.v.) penetrated to B., and were enthusiastically received by John Huss (q.v.). The intense ferment that resulted from the religious and national reforming zeal of Huss and Jerome of Prague (q.v.) culminated in the burning of Huss and Jerome during the Council of Constance (q.v.), and in the protracted war of the Hussites (q.v.). In 1410 Sigismund (q.v.) was elected Ger. emperor, but was not for many years acknowledged as King of B. He d. in 1437, and his successor, Albert II (q.v.), reigned for only 2 years. Albert left a posthumous son, known as Ladislav Posthumus, and in 1452 Georg

Poděbrad (q.v.) became regent for this child. When Ladislas d. in 1457, Poděbrad was elected King of B. His reign was marked by continual struggles with Matthias Corvinus (q.v.), King of Hungary. Poděbrad was succeeded in 1471 by Vladislav, son of Casimir IV (q.v.) of Poland. Vladislav, who also became King of Hungary in 1490, was an inefficient ruler, but he negotiated two important marriages: that of his son Louis to Mary, the grand-daughter of Maximilian I (q.v.), and that of his daughter Anne to Maximilian's grandson, Ferdinand. Louis (Louis II of Hungary) was killed at Mohács (q.v.) in 1526, and Ferdinand thereupon claimed the kingdoms of B. and Hungary through his wife. He was elected to the Bohemian throne, and with difficulty also obtained that of Hungary. In 1547 he succeeded in having himself declared hereditary, instead of elective, ruler of B., and thus B. became an appanage of the Hapsburgs. Ferdinand became Ger. emperor (see FERDINAND I) in 1556, and on his death he was succeeded by Rudolf II (q.v.). In 1609 the Bohemians compelled Rudolf to grant religious toleration (the Letter of Majesty), and in 1611 he was forced to abdicate the throne of B. in favour of his younger brother Matthias. In 1619 Matthias was succeeded by Ferdinand II (q.v.), grandson of Ferdinand I, though the Protestants had already offered the throne of B. to a Lutheran prince, Ferdinand V, the Elector Palatine. The famous 'defenestration' of Prague in 1618 (Lat. *fenestra*, a window) was the throwing through the windows of the Hradčany castle (see PRAGUE) of the emperor's counsellors by some of the Protestant nobles. This was the opening event of the Thirty Years War (q.v.). In the great battle of the White Mt. at Prague in 1620 (see TILLY), the Bohemian Protestants were defeated: the lands of the Protestant nobles were sequestered, and the Protestant religion was suppressed. After the treaty of Westphalia (q.v.) the hist. of B., under the rule of the emperor of Vienna, became generally co-incidental with that of Austria (see AUSTRIA, History). During the reign of Joseph II (q.v.) religious toleration was restored. In the 'year of revolutions,' 1848, a Pan-Slav congress was held in Prague, and an attempt was made to assert the anct independence of B. A rising in Prague was quickly put down, but the Vienna gov. afterwards adopted a conciliatory policy, and B. was granted a local diet in 1861. In 1897 the Bohemians agreed to take part in the deliberations of the parliament in Vienna, without prejudice to their claim that B., Moravia, and Austrian Silesia (see SILESIA) should together be accorded the same privileges as Hungary. The Czech language was compulsorily taught in schools, and there was an attempt to make a knowledge of the language obligatory for every gov. official accepting employment in B. The Bohemian question was eventually solved by the collapse of Austria-Hungary during the First World War, and the success of

the Czechoslovak movement. See also CZECHOSLOVAKIA.

See W. S. Monroe, *Bohemia and the Czechs*, 1910; Count F. Lützow, *The Hussite Wars*, 1914, and *Bohemia*, 1920; E. Boneš, *Bohemia's Case for Independence*, 1917; V. Nosek, *Independent Bohemia*, 1918, and *The Spirit of Bohemia*, 1926; C. E. Maurice, *Bohemia from the Earliest Times to the Founding of the Czechoslovakia Republic in 1918*, 1922; Elizabeth Wiskemann, *Czechs and Germans*, 1938.

Bohemia, Forest of (Ger. *Böhmerwald*; Czech. *Český Les* in NW., *Šumava* in SE.), mt range between Czechoslovakia and Bavaria, about 120 m. long and 25 m. broad. It is largely covered with dense forest, and towards Bavaria it is rugged and broken; the S. portion is called the Bavarian Forest. The highest points are Arber, 4780 ft., and Rachelberg, 4765 ft. It is crossed by 4 roads and by 3 railways.

Bohemian Brethren, see MORAVIANS.

Bohemund I (c. 1058–1111), Prince of Antioch, eldest son of Robert Guiscard, distinguished himself in the war against the Emperor of Byzantium in 1081. He was excluded from the throne of Apulia by his brother Roger, and took part in the first crusade. After the capture of Antioch (1098) he estab. himself there as prince. He was, however, imprisoned by the Turks in 1100, but after 3 years' captivity returned to Europe and renewed the war against Alexius. He married a daughter of Philip of France, and spent the rest of his life in Apulia.

Bohlen, Peter von (1796–1840), Ger. orientalist, son of a poor peasant. Orphaned at an early age, he had to earn his living as a servant, a tailor-apprentice, a waiter, and so on. At 21 he began his studies, and soon acquired some knowledge of Hebrew, Arabic, and Persian. From 1822 he studied at Bonn (Arabic with Freitag, and Sanskrit with A. W. Schlegel). In 1823 he was appointed prof. in the univ. of Königsberg. His first pub. was *Symbolae ad Interpretationem Sacr. Cod. ex lingua Persica*, 1822. His main works were *Das alte Indien* (2 vols.), 1830, *Bhartrihari's sententiae*, 1833, *Die Genesis*, 1835, and *Rituanahra . . . carmen Kālidāsi*, 1840. His vast scientific output had certain failings—he worked in too many fields (Hebrew, Arabic, Persian, Sanskrit, etc.); he had no profound knowledge of grammar; his conclusions, often based on insufficient proof, were not altogether accurate.

Böhme, or Bohm, Jakob. See BOEHME, JAKOB.

Böhmen, see BOHEMIA.

Böhmerwald, see BOHEMIA, FOREST OF.

Böhmisch-Brod, see ČESKÝ-BROD.

Böhmisch-Leipa, see ČESKÁ LÍPA.

Böhmisch-Trübau, see ČESKÁ TREBOVÁ.

Bohn, Henry George (1796–1884), bookseller and publisher. b. London, where his father, a Westphalian by birth, had a second-hand bookshop. Upon his father's refusal to admit him to partnership with him Bohn set up in business for himself, and in 1841 his 'guinea catalogue'

of rare books attracted much attention. In 1846 he originated his Standard Library of reprints, and followed with a series of other libraries, until in 1853 he had issued over 600 vols. in cheap form. Many of the trans. and compilations were his own work. He ed. also Lowndes's *Bibliographer's Manual*, *The Origin and Progress of Printing*, 1857, and the *Biography and Bibliography of Shakespeare*, 1863.

Bohol, one of the Philippine Is. It is situated between Cebu and Leyte, and lies in lat. 10' N., long. 124° E. Its area is 1191 sq. m., and its pop. 449,549.

Bohr, Niels Henrik David (1885-), Dan. physicist, son of Christian B., prof. of physiology at Copenhagen. He was educ. at Gammelholme school and at Copenhagen. Univ. lecturer in physics at Copenhagen 1913, and in Manchester, 1914-16, and prof. of physics at Copenhagen, 1915, and, subsequently, director of the Institute of Theoretical Physics at Copenhagen. In 1922 he was awarded the Nobel prize for physics in respect of his research work in relation to the structure of atoms and the emission of spectra—researches allied to the experimental work of Ernest Rutherford (see RUTHERFORD, LORD), the discoverer of the nucleus of atoms. It was as a lecturer in Manchester Univ. that he began his close collaboration with Rutherford, whose ingenious and at that time warmly contested theory of atoms B. developed by his own bold experiments, and in 1917 he pub. an epoch-making series of studies on the atomic theory. This work, together with Einstein's and Planck's researches (see also QUANTUM THEORY), opened a new chapter in the hist. of physics, for he laid down a group of new principles which departed radically from classical mechanics. It led to the theory of stable electron orbits around the nucleus and explained many of the features of optical and X-ray spectra, and of the periodic system of elements. He was awarded the Nobel prize in 1922. In 1926 he was elected foreign member of the Royal Society, and was awarded the Hughes Medal in 1921 and the Copley Medal in 1938. During the Second World War he escaped from Ger.-occupied Denmark, and assisted with atom bomb research in America, returning to Denmark after the war. He has pub. numerous treatises on physics, and is chairman of the Dan. Commission of Nuclear Energy.

Böhtlingk, Otto Nikolaus von (1815-1904), Ger. Sanskritist, b. St Petersburg. His first important work was a treatise on the Sanskrit grammar by Pāṇini, 1839-1840 (revised, 1887). He pub. various articles in the *Mémoires* of the Petersburg Academy. His work *Über die Sprache der Jakuten* is the earliest scientific research on a Turki language. He ed. various Sanskrit texts, but his main works are *Sanskrit-Wörterbuch* (with R. Roth and other scholars) (7 vols.), 1853-1875, *Sanskrit-Wörterbuch in kürzerer Fassung* (7 vols.), 1879-89, *Indische Sprüche* (3 vols.), 1863-5, and *Sanskrit-Chrestomathie*, 1845.

E. E. 2

Bohun, name of a family which played a conspicuous part in Eng. hist. during the 13th and 14th cents. Their founder was Humphrey, a companion of William the Conqueror, but Humphrey (III), steward in the household of Henry I, was the first representative of note. Henry B. received the earldom of Hereford from John (1199). As their lands lay on the Welsh borders, the B.s were important Marcher barons. Humphrey (VII) was among the nobles who obtained from Edward I the Confirmatio Cartarum (1297). Humphrey (VIII), a lord ordainer, fought for Edward II at Bannockburn (1314), and was taken prisoner. The male line of the family became extinct in 1373. See ESSEX, EARLS OF.

Boiano, see BOJANO.

Boiardo, Matteo Maria, Count of Scandiano (c. 1440-94), It. poet, b. Scandiano; educ. at the univ. of Ferrara. His intimacy with Duke Ercole led to his appointment as governor of Modena in 1481 and of Iggio in 1487. His best work is the *Orlando Innamorato*, which Ariosto imitated and continued in his *Orlando Furioso*. Berni (q.v.) pub. a revised version of it in 1542. He is known also for trans. of Herodotus, Apuleius, and Lucian, and his *Sonetti e Canzoni*: the dramatisation of Lucian's *Timon* is especially to be noted. The latest ed. of his works is by A. Zottoli, (2 vols), 1935-7. See G. Reichenbach, *Matteo Maria Boiardo* (Bologna), 1929 and E. Bigi, *La Poesia di Boiardo*, 1941.

Boie, Heinrich Christian (1744-1806), Ger. poet and critic, b. Meldorf in Schleswig-Holstein. In 1769 he became the leader of the *Göttinger Dichterbund*. His own work was mediocre, and his importance is rather as editor, and founder in 1770 with F. W. Gotter, of the *Göttinger Musenalmanach*, and later, in 1776, as editor of *Das Deutsche Museum*, a monthly magazine with a high literary standard.

Boieldieu, François Adrien (1775-1834), Fr. composer, b. Rouen. At an early age he manifested a talent for music, and at 18 composed a one-act opera which was produced at Rouen. He studied music in Paris. In 1803 he occupied the post of *maitre de chapelle* to Emperor Alexander at St Petersburg, but in 1811 returned to Paris to produce more operas, including the 2 most successful, *Jean de Paris*, 1812, and *La Dame blanche*, 1825. The latter is based on Scott's *The Monastery* and *Guy Mannering*. Other favourites among his 37 operas were *Le Calife de Bagdad*, 1810, *Ma Tante Aurore*, 1803, *Aline, Reine de Golconde*, 1804, and *Le Petit Chaperon Rouge*, 1818. He also set the choruses in Racine's *Athalie* in Russia. His last years were troubled by illness and poverty. See A. Pougin's *Boieldieu, sa vie, ses œuvres*, 1875.

Boii, powerful Celtic tribe (see CELTS), which inhabited originally part of Transalpine Gaul (see GALLIA). Later the B. settled in the dists. between the Po and the Apennines and between the Danube and the Tyrol (qq.v.). Other members of

the tribe settled in the country now named Bohemia (q.v.) after them. The B. are frequently mentioned by Caesar, Livy, and Polybius.

Boil, or **Furuncle**, abscess of hair follicle or sweat-gland (see **SKIN**). The infecting organism is practically always a staphylococcus (see **CARBUNCLE**). Like all bacterial skin infections, a B. is contagious. B.s in other parts may occur from the transference of bacteria by the fingers or other means. Infection of other people may result from direct contact or from contamination of baths, wash-basins, utensils, etc.

Boileau, Ethel Mary, Lady (1882-1942), novelist, b. London. Daughter of the Rev. J. F. Young, she was educ. privately and in Germany, and in 1905 married Sir Raymond Boileau, Bart., Deputy Lieutenant of Norfolk. Her novels, many of

polished style, than his satires. He was appointed historiographer to the king in 1677, and from that time his literary products are fewer in number; 5 new epistles and the 5th and 6th cantos of *Le Lutrin* were pub. in 1683, but they are not equal in quality to his earlier work. The *Dialogue des héros de roman*, pub. in 1713, which practically killed the vogue of romantic novels, had been written long previously. He was elected a member of the Academy, by the king's wish, in 1684. A complete ed. of his works in 4 vols. was pub. in Paris, 1870-1873. See A. F. B. Clark, *Boileau and the French Classical Critics in England*, 1925; D. Mornet, *N. Boileau*, 1941; R. Dumasnil, *Boileau*, 1943.

Boiler, vessel for converting a liquid, usually water, into vapour (steam) by boiling. The B. used with the earliest

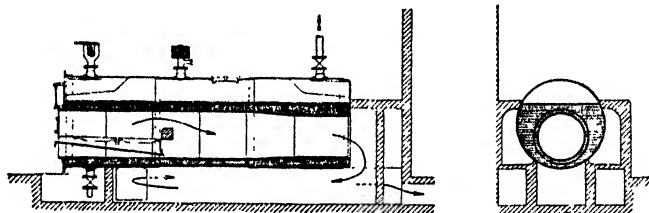


FIG. 1. CORNISH BOILER

which deal with Scottish clan hist., include *Fire of Spring*, 1914, *Hippy Buchan*, 1925, *The Arches of the Years*, 1930, and *Clansmen*, 1936.

Boileau-Despréaux, Nicolas (1636-1711), Fr. critic and poet, b. Paris. He studied first theology and then law at the Sorbonne. He was called to the Bar in 1656, but was so disgusted at the chicanery prevalent that he threw up his profession, and lived on the small fortune which his father, who d. in 1657, had left him. His earliest work of any note was his first satire, which he pub. in 1660; 8 others followed this, and still later he wrote 4 more, bringing the number up to 12. In these works, which were modelled on Juvenal and Horace, he showed the capabilities of the Fr. language for expressive and at the same time regular verse. While writing his satires he was living in an artistic coterie which included Racine, Chapelle, and Antoine Furetière, and it was no doubt in his intercourse with them that he gained many ideas for his *Art poétique*, 1675. In this work he taught the value of artistic workmanship for its own sake, and reduced versification to rule; Pope was greatly influenced by it, and Eng. literature through Pope. In the same vol. as the *Art poétique* were included the first 4 cantos of *Le Lutrin*, and the first 4 of his *Épîtres*. *Le Lutrin*, which is one of his best-known works, is a serio-comic epic; his epistles are characterised by a graver tone, as well as a more

steam engines was a rectangular cast-iron box heated by a fire underneath. Watt's B. was an improvement: it was made of wrought iron, had an internal flue, and generated steam at a pressure of 10 lb. per sq. in. Modern B.s are built either as cylindrical shells holding the water and steam and traversed lengthwise by one or more flues, or as a system of tubes in which steam is generated, passing through the furnace gases and connected to one or more drums containing the water. Efficient combustion of the fuel, efficient heat-transfer, good circulation of the water, and, under special circumstances, quick starting, are the main demands on the design.

Cylindrical boilers. The *Cornish B.* (Fig. 1) has 1 flue passing through the cylinder, which, in the compound type, terminates beyond the fire in a plate from which fire tubes run to the back of the B. The *Lancashire B.* has 2 flues sometimes traversed by cross-water tubes. These B.s and their variants, the *Yorkshire* and the *Thompson*, are mainly used for heating and process work. They are simple in design, but slow starters and not very efficient. In the single-ended *Scotch Marine B.* the hot gases pass from the furnace to the combustion chamber and there through tubes above the furnace flue to the smokebox (Fig. 2). There may be from 1 to 4 furnaces. The double-ended B. has furnaces at both ends. This B. is largely used on cargo

vessels because of its simplicity. *Vertical B.s* (Figs. 3 and 4) are used for small engines, cranes, pumps, etc. They are simple and take up little space. One type has a vertical shell and 1 flue with cross tubes, another type has the flue divided into sev. tubes; the Cochran B.

surface consists of a series of inclined straight tubes over the furnace (see Fig. 5). Here the water is raised to a high temp., and rises through a series of separate 'headers' of serpentine form, to a horizontal steam and water drum, where the steam separates from the

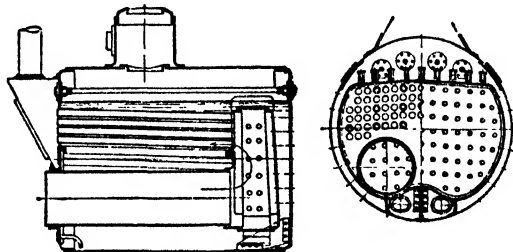


FIG. 2. SINGLE-ENDED SCOTCH MARINE BOILER

has a combustion chamber and horizontal return tubes leading to an external smokebox.

Water-tube boilers. The bulk of the steam and water is contained in one or more drums, placed out of the direct path of the furnace gases, while steam is generated in a large number of tubes, connected to the drums, through which the water circulates. Water-tube B.s are almost universally employed in power stations, and in factories which require

water. The water remaining returns through the vertical tubes at the back of the B. into the inclined tubes, where it is heated, and again passes into the steam and water drum; thus a rapid circulation in one direction is kept up, and a uniform temp. maintained throughout the B. A mud drum is attached to the lowest point of the inclined water tubes, into which any matter held in suspension in the water is precipitated. In the Marine type, height and weight are saved by placing the steam and water drum transversely at the back end of the B., immediately above the back headers. The front headers are connected with the drum by horizontal tubes. The tubes are of seamless steel. Opposite the end of each tube in the headers is an opening or hand-hole through which the tube can be examined and cleaned, each opening being closed by a forged-steel door and stud. The drum is made of riveted B. plate, and the headers of forged steel, while the B. is suspended on mild-steel girders and columns; the sides of the B. are encased in brickwork. Between the inclined tubes and the drum is placed a super-heater, consisting of steel tubes bent into a U-shape and connected to 2 'collectors,' the upper of which receives the wet steam from the B., while the lower one returns the superheated steam to the stop valve above the B. The *Multi-drum Water-tube Land B.s* consist of 2 sets of drums, at the top and bottom of the B. respectively, connected by rows of water tubes. The upper or steam drums are interconnected by means of a few large tubes, which are not reckoned in the heating surface of the B.; the lower or mud drums are similarly joined. The *Stirling B.* is shaped like a distorted letter W, the drums being placed at the 5 apices, and the rows of tubes forming the body of the letter (see Fig. 6). The feed water is led into the back steam drum, and then passes down the rear bank of

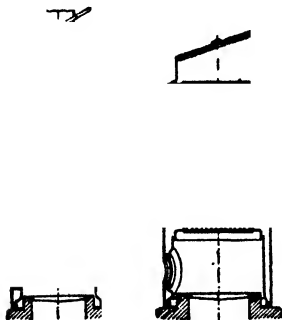


FIG. 3

FIG. 4

VERTICAL BOILERS

steam for power purposes. At sea, water-tube B.s are used in the navy, and in the faster and larger steamships of the mercantile marine. The tubes are subject to internal pressure, and are heated externally by the furnace gases; there is thus no danger of the tubes collapsing, and water-tube B.s can therefore stand much higher pressure than other B.s. In the *Babcock & Wilcox B.* the heating

water tubes to the back mud drum, there being no direct water connection between the back and middle steam drums; only the steam spaces are connected. The rear bank of tubes, being in contact only with furnace gases that have been cooled by passage through the rest of the B.,

the steam drums, and so are free to expand and contract. The drums are made of riveted B. plate, with the seams away from the fire, while the tubes are weldless. The Stirling B. is a free steamer, with a good circulation, and is extensively used in power stations. The tubes of the

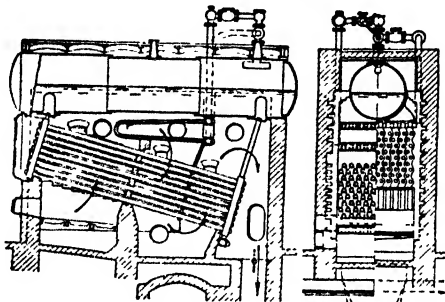


FIG. 5. RABCOCK AND WILCOX BOILER, LAND TYPE

serves chiefly to heat the feed water to the temp. of evaporation. The water then passes up to the middle steam drum, down to the front mud drum, and up to the front steam drum, where it disengages the steam that has been formed during the circulation. The remaining water passes across to the middle steam drum via the water-connecting tubes, where it joins with the new feed water, and passes down again to the front mud drum. The furnace gases pass over the water tubes in the opposite direction to the water, as shown in the figure. Steam is drawn off from the middle steam drum, and is taken through a superheater

Stirling B. are curved to enter the drums radially, and this means that a large number of different shapes of tube have to be kept in stock for repairs. A superheater is usually placed between the first and second banks of tubes.

The *Yarrow B.*, widely used in the Navy, is shaped like an inverted letter V, and consists of one main steam and water

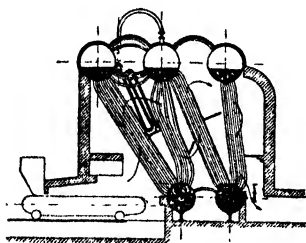


FIG. 6. STIRLING BOILER

placed just behind the front bank of water tubes, before being delivered to the engines. The 3 steam drums are supported on brackets carried on mild-steel beams, which in turn are supported on mild-steel columns; these columns are built entirely independently of the brickwork, which only serves to contain the heat of the furnace. The 2 mud drums are suspended by the water tubes from

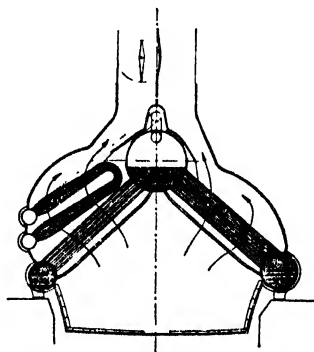


FIG. 7. YARROW BOILER

drum placed centrally over the fire grate, connected by 2 banks of inclined tubes to a couple of water or mud drums, one at each side of the grate. The furnace gases are divided, and pass through the 2 banks of tubes, then up each side of the steam drum, finally reuniting above to pass up the funnel. The tubes are nearly straight, and inclined at 45 degrees to the horizontal. The feed water is taken into

the 2 mud drums, and is made to pass up the tubes remote from the fire by means of a partition inside the drum. When it arrives in the steam drum, it mixes with the water, and joins the main circulation of the B., which is upwards in the tubes nearest the fire, and downwards in the further tubes (with the exception of the few tubes reserved for the feed water). When a superheater is fitted, it is placed outside one tube bank, in which the number of water tubes is reduced, in order to leave enough heat in the gases to superheat the steam. The superheater consists of a number of U-shaped steel tubes joining 2 cylindrical collectors. A damper is placed in the smoke uptake above the superheater, which can be closed when steam is shut off, to prevent burning the empty superheater elements. The drums of the Yarrow B. are made in 2 semi-cylindrical portions of steel plate, riveted together, the part to which the tubes are fitted being thicker than the other part. Yarrow B.s are usually oil-fired on account of cleanliness, ease of refuelling, and reduction of stokehold personnel. Yarrow B.s are very quick steamers, and give a high efficiency.

Superheaters. The efficiency of all classes of steam engine is greatly increased by the use of superheated steam (see STEAM ENGINES); that is, steam heated above the boiling-point. Superheated steam is dry and invisible. The superheater consists of a set of tubes, placed in the way of the furnace gases, through which the steam passes on its way from the B. to the engine. Superheaters are hardly ever fitted to cylindrical land B.s, and not often to Scotch marine B.s. Modern locomotive B.s nearly always carry superheaters, while certain vertical B.s, used on steam railcars, are also superheated. Water-tube B.s are fitted with superheaters as a rule.

Feed-water heaters. Heating the feed-water before it reaches the B. increases the efficiency of the B. This is done by means of steam from the engine, taken either from the exhaust, or from some intermediate point in the engine, where the steam has not finished its expansion; this is called 'bleeding' the engine, and is much practised in modern turbine plants.

Economisers. In an economiser, the B. feed-water is heated by the residual heat in the furnace gases, after they have passed through the B. and superheater. Thus heat is utilised which would otherwise be wasted up the chimney. Economisers are used on all types of land B.s, except where large steam turbines are installed (see above), and sometimes on marine B.s.

Air preheaters. The efficiency of a B. is increased by heating the air required for combustion before it reaches the fire. This is done by the residual heat in the furnace gases, after they have passed through the B. and superheater. Where an economiser is fitted there is hardly sufficient heat in the gases to make an air preheater worth while. In turbine plants, however, where feed-water heaters are installed, air preheaters are used; they

are also often used with marine B.s. Air preheaters require forced or induced draught.

Auxiliaries. Gauge glasses are fitted to the B.s of all types, so that the water-level can be read. It is usual to have 2 gauge glasses. Further, all B.s are fitted with at least 2 safety valves, which are set to the pressure which the B. is authorised to carry. They are locked in such a manner that while the weight on them can be eased, so that they may allow the steam to blow off at a lower pressure than the designed one, it is impossible to screw them up to blow off at a higher pressure. All B.s are fitted with a pressure gauge; in addition there is a stop valve, by which the steam generated is let off for use, and by shutting which the B. can be isolated; a check valve of special design, so that feed-water can enter the B., but the water and steam cannot leave the B., and a blowdown valve, by which the B. can be emptied for repairs, inspection, etc.

Firing. Fuels used include coal, wood, pulverised coal, oil, and gas. Wood is largely an emergency fuel, and gas is only used on small B.s. Coal is burnt on a grate consisting of steel or cast-iron bars; mechanical stokers are used on large steam plants, the grate being an endless chain moving slowly forward, coal being spread evenly over one end by a hopper. In another method the coal is dropped at the back of the grate and moved forward by vibration of the fire-bars. Pulverised coal (q.v.) can be treated like a gas and blown on to the furnace by a fan. Oil-firing is now the rule in the navy.

Recent developments. The modern tendency is in the direction of higher pressures, but superheat temps. do not show many signs of an increase beyond the present maximum of 850° F., due to decrease in strength, at high temps., of the steel of which superheaters, steam pipes, and turbines are constructed. Among high-pressure B.s may be mentioned the *Benson B.*, which works at a pressure of 3200 lb. per sq. in.; at this pressure, steam has the same density as water, and is generated without ebullition—there is, in fact, no definite water line. The B. consists of a coil of steel tube, into one end of which water is forced, and from the other end of which steam issues. The *Loeffler B.* consists solely of a superheater and a steam accumulator (q.v.), with no B. proper. Steam at 1700 lb. per sq. in. is circulated by a pump from the accumulator through the superheater; of the superheated steam, a quarter is used for power purposes, while the other three-quarters is blown back into the water of the accumulator; the heat taken up in the superheater generates more saturated steam from the accumulator water, and this is re-circulated by the pump. In this B. there are no scaling troubles, all scale being deposited on the non-heated walls of the accumulator. The *Wood B.* consists of a furnace surrounded by water tubes, all of which are exposed to the direct action of the fire. So much heat

is left in the furnace gases after passing these, that a superheater, an economiser, and air preheater are fitted to utilise it. Some special B.s for power stations have recently been built for steam generation at a rate of 290,000 lb. per hr. at 750° F. and a pressure of 1400 lb. per sq. in. (The Amer. way of expressing 'pounds per square inch' is psi). The heating surface is 42,370 sq. ft. See also SCALE; BOILER; CORROSION; ACCUMULATOR. See R. L. Batley and E. G. Barber, *Boiler Plant Technology*, 1942; H. C. Armstrong and C. V. Lewis, *Boiler Management, Maintenance, and Inspection*, 1945; S. D. Scorer (ed.), *Steam Boiler Year Book and Manual*.

Boiling, see COOKERY; LIQUID; WATER. **Boiling Point** (water), see METROLOGY and WATER.

Bois, John (1561-1644), translator of the Bible, was educ. at St John's and Magdalene colleges, Cambridge. He was one of the translators for King James's Bible in 1604, and member of the board of revision. He trans. a portion of the Apocrypha and of the sections from Chronicles to the Canticles. He also assisted in Sir Henry Savile's ed. of Chrysostom (printed in 1610-13). He became prebendary of Ely in 1615.

Bois-Brûlés, from the Fr., meaning burnt wood, or the colour of burnt wood, name given by the Fr. Canadians to those of mixed white and Indian parentage.

Bois de Boulogne, park in Paris, to the W. of the city, bordered by the Seine, and covering 2200 ac. It was enclosed c. 1800, and was given to the city by Napoleon III in 1852. In it are the racecourses of Antouillet and Longchamp (q.v.), zoological and botanical gardens, and fine drives, especially the fashionable Allée de Longchamp.

Bois-le-Duc, see 's HERTOGENBOSCH.

Boise, cap. of Idaho, U.S.A., and co. seat of Ada co., on Boise R. The largest city in the state, it is a rail and distribution centre for a gold-mining and agric. area served by B. irrigation project. Food processing and the manuf. of furniture, electrical equipment, foundry and wood products, rugs, and mattresses are important. It has a municipal airport and a veterans' hospital. Pop. 34,390.

Boissière, Sulpice (1783-1854), Fr. art collector. In conjunction with his brother Melchior and a friend Bertram he assembled the notable collection of 200 paintings, which was afterwards sold to the King of Bavaria.

Boissier, Marie Louis Gaston (1823-1908), Fr. scholar and critic, b. Nîmes. Appointed prof. of rhetoric at Angoulême in 1846, and later at the Lycée Charlemagne in Paris. In 1861 he pub. his essay on Terentius Varro, and was appointed prof. of Lat. oratory at the Collège de France. His prin. work, *Cicéron et ses amis*, 1865, was trans. into English by A. D. Jones, 1867, and has been frequently reprinted. B. was elected in 1876 to the Fr. Academy, of which in 1895 he was appointed perpetual secretary.

Boissy d'Anglas, François Antoine,

Count of (1756-1826), Fr. politician, b. St Jean-la-Chambre in Ardèche. He became a member of the States-General in 1789, and in 1794 helped to overthrow Robespierre. He was elected secretary of the Convention and member of the Committee of Public Safety. His last honours were his presidency of the Council of Five Hundred, senatorship under Napoleon, and his elevation to the peerage by Louis XVIII. Subsequently, however, he supported Napoleon during the Hundred Days and was banned from the Senate for a time afterwards. He was a writer of some note on literary subjects.

Boito, Arrigo (1842-1918), It. poet and composer, b. Padua and studied at the Milan Conservatory. For some time he worked as a journalist in Milan and Paris, and he served under Garibaldi in Austria. He travelled much in France, Germany, and Poland, and in 1868 produced his opera *Mefistofele* at La Scala in Milan. It proved a failure but was more successful when played in shorter form in 1875. His only other opera was *Nerone*. He destroyed the music of *Ero e Leandro* (an early work), and the libretto was used by Bottesini and Mancinelli; *Nerone* was produced after his death, in 1924. He wrote librettos for his own works and those of other musicians including Ponchielli's *Gioconda* and Verdi's *Otello* and *Falstaff*, and also pub. songs, novels, critiques, and dramas. Of his verse the longest piece is *Ite Orso*, a narrative poem describing the atrocities of the Minotaur. In 1912 he became a member of the Senate.

Boja, see BWA.

Bojador, Cape, headland of W. Africa first doubled by Portuguese navigators in 1434.

Bojano, or Boiano, It. tn in Abruzzi e Molise (q.v.), 10 m. SW. of Campobasso (q.v.). Many buildings, including the cathedral, were severely damaged during the Second World War. Pop. 6000.

Bojer, Johan (1872-) Norwegian novelist. He is essentially a moralist and controversialist, and his novels mostly deal with social and political problems. His best-known works are *Troens magt*, 1903. *Liv*, 1911, and *Den siste Viking*, 1921, a picture of life among the Lofoten fishermen. Although lacking in depth and originality, B. has achieved great popularity, especially outside Norway. See P.-G. La Chenais, *Bojer, sa vie et ses œuvres*, 1930.

Bojnurd, dist. and tn in Persia in prov. of Khorasan; fertile soil; Shadlu Kurds were settled in the dist. in Safavid times. Pop. of tn about 9000.

Bok, Edward William (1863-1930), Amer. editor, b. Holden, Netherlands. He emigrated at the age of 6 with his parents to the U.S.A., where he attended a public school and became famous as one of the most successful magazine editors of his time. He joined Cyrus H. K. Curtis as editor of the *Ladies' Home Journal*, which he raised to a circulation of 2,000,000. Author of *The Americanisation of Edward Bok*, 1920, *A Man from Maine*, 1923, and *Twice Thirty*, 1924.

Boka Kotoraka, see HERCEGNOVI.

Boko, tn of F. Guinea in W. Africa on the R. Nunez. About 45 m. inland, with trade in rubber and coffee.

Bokelmann, Christian Louis (Ludwig) (1844-94), Ger. genre painter, b. near Bremen. He was a pupil of Sohn at Düsseldorf Academy, winning fame for both serious and humorous scenes, such as 'House of Sorrow,' 1873, 'Pawnbroker's Shop,' 1876 (in Stuttgart Gallery), 'Opening of the Will,' 1879 (Berlin National Gallery), 'The Emigrants,' 1882 (Dresden Museum), and 'The Arrest' (Hanover Museum). In 1893 he was appointed prof. of Berlin Academy.

Boker, George Henry (1823-90), Amer. playwright, poet, and diplomat, b. Philadelphia. Son of a banker, he was educ. at the College of New Jersey, now Princeton. He studied law, but turned to writing. In 1848 he pub. *Calaynos*, a blank verse tragedy of medieval Spain, which made its first appearance at Sadlers Wells before being produced in Philadelphia. Other tragedies of a similar type and setting were *Leonor de Guzman*, 1853, and *Francesca da Rimini*, 1855, sometimes claimed to be the greatest Amer. tragedy of the 19th cent. In 1856 his main works were collected in *Plays and Poems*, and in 1869 appeared *Königsmark, The Legend of the Hounds, and Other Poems*. B. was famous for his sonnets, of which he wrote over 300. In 1871 he was appointed Amer. minister to Turkey, and in 1875 minister to Russia; while holding these posts he negotiated 2 important treaties. One of his last compositions was *Nydia*, a tragedy. See E. S. Bradley, *George Henry Boker, Poet and Patriot*, 1927.

Boksburg, tn in the Transvaal, S. Africa, 14 m. E. of Johannesburg, an important gold-mining centre. Pop.: White, 26,800; Bantu, 70,000.

Bol, Ferdinand (c. 1611-81), Dutch painter, b. Dordrecht. His subjects were chiefly portraiture. At one public exhibition he was declared to have excelled Rembrandt, but he degenerated into a bad imitator in his later years. Many of his pictures are to be found in the museum at Amsterdam, while his 'Four Regents of the Leprosy Hospital,' generally regarded as his masterpiece, is in the tn. hall.

Bola-bola, see BORA-BORA.

Bolama, tn on the is. of the same name, situated at the mouth of the Rio Grande, W. Africa.

Bolan Pass, in Pakistan, defile in the Hala Mts of Baluchistan leading into Sind. It is about 55 m. in length, and its greatest elevation is 5800 ft. On all sides there are steep precipices, and it is traversed by the Bolan R., frequently bridged over. A railway has been constructed through it connecting Quetta with Sibi and the Indus valley.

Bolarum, former Brit. military cantonment, now part of Secunderabad, in the state of Hyderabad, India.

Bolas (Sp., 'balls'), hunting weapon used by natives and gauchos of S. America, especially by the Paraguay Indians and natives of Argentina. There are 2

varieties constructed on slightly different principles, one being made of 2 stone or clay balls covered with leather and connected by a rope or thong of 6 or 8 ft, the other being made of 3 balls connected by 3 short thongs which unite to form a long rope. The hunters, on horseback, throw them at the animal in such a way as to entangle its legs and prevent escape.

Bolbec, Fr. tn in the dept of Seine-Inférieure, on the Bolbec, 19 m. from Le Havre. In the 16th cent. it was a Huguenot stronghold. It has a considerable cotton spinning and weaving industry, and dyeing, printing, and sugar works. Pop. 10,500.

Bolbocerus, coleopterous insect of the family Scarabaeidae, members of which are usually called chafers. Their most common colour is brown or yellowish, and sometimes black; *B. mobilicornis*, a pitchy-black species, and *B. testaceus*, an ochre-coloured species, have been found in England.

Bolcke, Captain von, Ger. naval officer; commander of the battleship *Pommern*. At the battle of Jutland, 31 May 1916, the *Pommern* was a unit of the Ger. 2nd Battle Squadron and was sunk. B. went down with her.

Bold, Samuel (1649-1737), Eng. controversialist, made vicar of Shapwick, Dorset, in 1674. He resigned this living, and in 1688 was instituted rector of Steeple, Isle of Purbeck, to which Tyneham was united in 1721. Here he remained until 1737. In 1682 he preached and pub. a sermon against persecution, and followed it with a *Plea for Moderation towards Dissenters*, for which he was fined and imprisoned. His works include tracts defending John Locke's philosophy.

Boldrewood, Rolf, pseudonym of Thomas Alexander Browne (1826-1915), Anglo-Australian novelist, who was b. in London and crossed to Australia in 1830. He received a good education at Sydney College. In 1844 he became a squatter in Victoria, and later police magistrate and commissioner of the New S. Wales goldfields. In 1888 he pub. his most popular work, *Robbery under Arms*, which had appeared in serial form 8 years earlier, attracting little notice, and in 1894 *A Modern Buccaneer*. Other books are *Old Melbourne Memories*, 1884, *The Squatter's Dream*, 1890, and *The Miner's Night*, 1890. See also AUSTRALIAN LITERATURE.

Bole, hydrous aluminium and iron silicates, found in Armenia, Saxony, Tuscany, S. America, Ireland, and the Isle of Skye in Scotland. In form the substance resembles clay, and is of a dull yellow, brown, or red colour, while it adheres to the tongue, feels greasy, is yielding, has a conchoidal fracture, and the streak is shining. The prin. varieties are Armenian and Lemnian, used as pigments and in medicine.

Bolction Moulding, in Renaissance architecture and especially in panelling, a moulding which projects in front of the framing of the panelling.

Bolero, Sp. national dance, quicker than the fandango; the name is applicable

also to the dance music. It is in 3-4 time, and of 18th-cent. origin. The performers are usually accompanied by castanets, sometimes also by a guitar or the dancers' own voices, and the movements are expressive of the various stages of the emotions of love. The most famous examples of the adaptation of the B. for compositions of their own are Chopin's *Polero* for piano and Ravel's for orchestra.

Bolesławiec (Ger. *Bunzlau*), tn of Poland, in Wrocław prov., on the Bobrawa (q.v.), 64 m. W. by N. of Wrocław (q.v.). Until 1945 it was part of Ger. Silesia (q.v.). It has been known for its pottery since the 16th cent. There are copper mines near by. Pop. 4000 (1939: 22,455).

Boletus, family Boletaceae, genus of pore-fungi, 200 species, cosmopolitan, with conspicuous fruit-bodies, fleshy with the hymenium of the cap formed in tubes. *B. edulis* and *B. scaber* are edible; *B. satanas* poisonous. Mainly terrestrial, some mycorrhizal, in woods and meadows.

Boleyn, or Bullen, Anne (c. 1507-36), Queen of England, second wife of Henry VIII. She was the daughter of Sir Thomas B. (q.v.). Anne was a maid of honour to Mary, Henry's sister, in France, c. 1519. She returned to England, c. 1522, and quickly became the centre of attention at court. Her vivacity and charm soon attracted the king, and her family, eager for advancement, encouraged the association. Henry was already anxious because he had no male heir by his wife, Catherine of Aragon (q.v.), and may already have seriously contemplated an annulment; but it remains doubtful if he would have gone to such lengths to marry Anne had she not consistently refused to become his mistress. Henry therefore applied for an annulment of his marriage so that he could marry Anne, the position being complicated by the fact that Catherine of Aragon was the aunt of the Emperor Charles V (q.v.), whose troops had sacked Rome in 1527 and who held Pope Clement VII a virtual prisoner. While the legal proceedings dragged on inconclusively Anne was ostentatiously accorded all the honours of a queen at Henry's court; and the king's love-letters to her, still extant, throw a revealing light on the tenderer side of Henry's character. When Wolsey failed to obtain the desired divorce Henry broke with Rome, and the Eng. eccles. courts pronounced his marriage to Catherine null. Henry married Anne secretly in Jan. 1533, and she was crowned queen at Whittem the same year. Their daughter, later Elizabeth I (q.v.) was b. in September 1533. But Henry's infatuation for Anne soon began to dissipate. Her self-confidence and indiscretions mortified him, and her failure to produce the son he desired was a bitter disappointment. Catherine of Aragon d. in Jan. 1536 and Henry was already being attracted by Jane Seymour (q.v.). Quarrels between the royal couple became frequent. In May 1536 Anne was sent to the Tower and was charged with adultery and incest. Her marriage to Henry was

declared null. It was obvious that there could be only one verdict to the charges against her, although it is extremely doubtful if she was guilty of anything more than indiscreet coquetry. She was beheaded on 19th May 1536 at Tower Green. See lives by P. Friedmann, 1884, and P. Sargant, 1934. See also H. Savage (ed.), *The Love Letters of Henry VIII*, 1949.

Boleyn, Sir Thomas, Earl of Wiltshire (1477-1539), Eng. courtier, father of Anne B. (q.v.). He became keeper of the exchange at Calais and of the foreign exchange in England in 1509. B. was employed on a number of diplomatic missions during the early part of Henry VIII's reign. He went with Poyning on an embassy to the Low Countries; in 1517 he became sheriff of Kent; 1519-20, B. went on an embassy to Francis I, negotiating the preliminary arrangements for the Field of the Cloth of Gold. In 1521 he was one of the commission by which the Duke of Buckingham was condemned. B. was created Earl of Wiltshire, 1529; Lord Privy Seal, 1530. He was ambas. to Charles V, and to France in connection with Henry's divorce from Catherine of Aragon.

Bolgary, see BULGAR.

Bolide (Gk *bolis*, a missile), fireball or meteoric body of greater brilliance and slower motion than the ordinary 'shooting star.' See AEROLITE and METEORITE.

Bolingbroke, Henry St John, Viscount (1678-1751), statesman, b. Battersea. He was educ. at Eton. He was a school-fellow of his great opponent Sir Robert Walpole, and was returned to parliament in 1701 for Wootton Bassett in Wilts. By his eloquence in debate he was soon able to command the attention of the House of Commons, and he attached himself to the Tories, at this time led by Harley. In 1704 he became secretary at war, in 1708 he retired with Harley, and in 1710 he came back to office in another of Harley's ministries. He was responsible for the treaty which was made secretly with France to end the war of the Sp. Succession. In 1712 he was made Viscount B. and Baron St John. In the meantime a quarrel had taken place between Harley (now Earl of Oxford) and B. which Swift attempted to patch up, but which in spite of all efforts still continued. The secret enmities of the 2 ministers were now concentrated on the problem of Queen Anne's successor. Both appear to have been definitely pledged to the Old Pretender. The quarrel with Harley ended in victory for B., and Harley left the ministry. B. was now supreme, his extreme Tory policy was favoured by the queen, and a Jacobite restoration seemed inevitable when the queen d. suddenly, and B. was ruined by the action which led to the appointment of the Earl of Shrewsbury to the lord-treasurership. On the accession of George I he was dismissed. In 1715 he fled to Paris for fear of being impeached as one of the participants in the treaty of Utrecht. He entered the service of the Old Pretender, but was soon dismissed.

He remained in France until 1723, when he was pardoned by George I, though Walpole saw that he was excluded from the House of Lords. B. now concentrated his literary energies on bitter attacks on Walpole, becoming the centre of Tory opposition; he was also a patron of Pope. He continued his writings and his intimacy with many of the leading men of letters of the day until his death. He wrote many books, among them *Reflections on Exile, Letters on the Study of History, The True Use of Retirement*, and the *Patriot King*. His *Patriot King* was the text-book from which Bute attempted to teach George III the elementary principles of kingship. Though B.'s literary reputation has not endured, he is remembered as a brilliant orator, a skilful diplomat, and as a clever if unprincipled political intriguer. He was buried at Battersea. See lives by A. Hassall, 1889, and Sir C. Petrie, 1937.

Bolitho, Henry Hector (1898-). New Zealand biographer, b. Auckland. Taking up journalism at the age of 17, he was one of the pressmen who accompanied the Prince of Wales in his tour of the country, of which he wrote in *With the Prince in New Zealand*, 1920. In 1921 he was editor of the Sydney *Sunday News*, and in the following year he came to England, where he wrote 2 novels, *Solemn Boy*, 1927, and *Judith Silver*, 1929. He is best known for his biographies of royalty, which include *Albert the Good*, 1932, *Victoria the Widow and her Son*, 1934, *Edward VIII: his Life and Reign*, 1937, *King George VI: A Character Study*, 1937, and *Victoria and Albert*, 1938. Later works are *The Romance of Windsor Castle*, 1946, *A Century of British Monarchy*, 1951, and *A Penguin in the Fyrrie*, 1955, reminiscences of the Second World War.

Bolitophagus, genus of coleopterous insects of the family Tenebrionidae; they are closely related to the meal-worm. Like other genera of this family, they live on fungi, but especially on boleti. *B. agaricola* occurs in Britain.

Bolívar, Simón (1783-1830), El Libertador, the hero of S. Amer. independence, b. in the city of Caracas, in Venezuela. He was descended on both sides from noble Venezuelan families. He studied in various European caps., especially in the law schools of Madrid, and was the witness of the final scenes in the Fr. Revolution in Paris. He married in 1801, and returned to Venezuela, where, however, he did not long remain, the death of his wife very shortly after their marriage resulting in his return to Europe (1804). His visit to the U.S.A. in 1809 resulted in his joining the party of independence in Venezuela, and he was given an important post to defend in 1811 on the declaration of Venezuelan independence. The attempted revolt was, however, a failure, and B. fled to Curaçao. In 1812 he joined the insurgents at New Granada, and at the head of a small force, forced the crossing of the R. Magdalena, and with 500 men pushed on to victory and proclaimed war to the death. His success

was only transient, and in 1814 his defeat by Boyes, and the success of the royalists generally, forced him again into exile. He went to New Granada, and from there to Kingston, where an unsuccessful attempt was made on his life. Undaunted by the ill success of a landing on the mainland in 1816, in the following year he was successful in driving the royalists before him and in reaching and making his H.Q. at Angostura. Here a congress was held in 1819, and afterwards he joined forces with the republicans of New Granada, and was entirely successful. He was now generally recognised as the hero of liberation. He succeeded in uniting Venezuela and New Granada into one rep. of Colombia, and was successful in his attacks against the Spaniards, who may be said to have been finally defeated at Carabobo in 1821. In the same year the constitution of Colombia was adopted, and B. became the first president. The next year he added Ecuador to the rep., and was later called to the help of the Peruvians, who were fighting for independence. At the end of 2 years' hard fighting their independence was won, and in 1825 the upper part of Peru changed its name to Bolivia in his honour. The constitution prepared by him for that country, however, did not prove popular owing to its arbitrary proposals, and was finally rejected by the Bolivians. He was, however, again elected president of the Colombian rep., but his dictatorial methods had roused general alarm, and the dread of a dictatorship put aside all past services. In 1829 Venezuela separated from Colombia, and in 1830 B., being voted a pension of \$3000, conditional on his residence elsewhere, resigned his power in Venezuela. His life and his fortune were given for the liberation of S. America, and his influence purified financial and judicial methods. His adoption of dictatorial methods was almost justified by his position, and he certainly was successful in creating a new spirit of independence and liberty in S. America. See V. A. Bolaunde, *Bolívar and the Political thought of the Spanish American Revolution*, 1938; T. Rourke, *Simón Bolívar*, 1940; E. Ludwig, *Bolívar: the Life of an Idealist*, 1948; Gerhard Masur, *Simón Bolívar* (Albuquerque, New Mexico), 1945.

Bolívar: 1. Dept of Colombia, S. America, the coastline of which forms the E. shore of the Gulf of Darien. It is densely wooded and has an area of 22,996 sq. m. Cattle-raising is important, and there are minerals, including gold, petroleum, and lime. Cap. Cartagena. Pop. 1,047,320.

2. Largest state of Venezuela, bounded on the N. by the Orinoco R., on the E. by Brit. Guiana, and on the S. by Brazil. The cap. is Ciudad B., famous in early days as Angostura. Forest industries and stockraising. Area 91,890 sq. m.; pop. 122,110.

3. A small prov. in central Ecuador. Pop. 104,570. The cap. is Guaranda.

Bolivia, the third largest political div.

of the continent of S. America. It is continuous with 5 different states, having Brazil on the N. and E., Peru and Chile on the W., and Argentina and Paraguay on the S. Its boundaries are purely conventional, following practically none of the physical features of the land, and cannot be altogether accurately stated, since they are continually the subject of dispute. It extends practically from $9^{\circ} 44'$ to $22^{\circ} 50'$ S. lat., and 58° to 70° W. long. Its area also cannot, owing to disputes, be accurately stated, but (excluding contested claims) is 514,155 sq. m. According to other estimates it is much more, and according to Bolivian claims,

made the unit, but most of the currency in circulation is paper.

Physical features. In B. the Andes approach closely the Brazilian uplands. In the W. dist. there are 2 main ranges, the W. Cordilleras, which divide B. from Chile, and the Cordillera Real, which is the name given to the section of the Andes on the E. side of Titicaca. In this group are found the Sorata or Illampu (23,000 ft) and the Illimani (21,185 ft). A remarkable feature of B. is the great tableland lying between the Andes and the Cordillera Real, which has an elevation of over 12,000 ft, and which contains the Lake Titicaca. The lake is about 120 m.



AYMARA INDIAN WOMEN OF BOLIVIA

L.N.A.

at least 600,000 sq. m. (the boundary between B. and Peru in the peninsula of Copacabana from the R. Suches to the N. of Lake Titicaca, has been delimited by a joint commission, and still remains to be ratified). That between Argentina and B., as determined by treaty ratified in 1889, was under review in 1925: B. ratified the substituted agreement in 1929, and Argentina in 1930. The pop. in 1900 was 1,744,568, but estimated in 1955 at 3,200,000. Its pop. may be divided into 3 fairly well-defined groups—the aborigines, Indians, who number between 200,000 and 300,000; the mestizos, natives with a slight European strain, who number nearly 1,000,000; and Europeans, who number between 600,000 and 700,000. Naturally an ill-assorted pop. such as this is liable to become a standing menace to the gov., and during the frequent disorders in B. they have often been a source of grave danger to the stability of the state. Administrative cap. La Paz (pop. 319,600). B. adopted the gold standard for its currency in 1928, when the gold boliviano was

long, and has a depth of about 120 fathoms. It lies partly in B., partly in Chile, and partly in Peru. Though B. has no coastline, it has a complete navigable water system, Lakes Titicaca and Poopó being connected by the R. Desaguadero, 200 m. in length. Although B. is usually taken to be a very mountainous country, in reality at least three-fifths of it is made up of low-lying and swampy ter. In the NE. there is an extensive plain, which is both well watered and well wooded, and is valuable for its supply of timber trees. The prin. rivs. are the Paraguay, the Pilcomayo, and, belonging to the basin of the Amazon, the Mamoré, the Beni, the Guaporé, and the Mochupa. The Cuiquite dist. forms part of the *yungas* zone, a name applied to the hot E. slopes of the Cordilleras which merge into the wooded plains of the Amazon. B. lies in the torrid zone, and its climate depends upon the elevation and not upon the lat. In the mt heights perpetual winter reigns, some of them being uninhabitable; between the elevations of 11,000 and 9000 ft the climate is of the

temperate zone; whilst in the *yungas* zone the climate is tropical, producing all tropical fruits and vegetation. The plains are hot and moist, and covered with dense forests. The indigenous flora comprises the palm, the cinchona, the bamboo, maté, and coca. Other productions of B. are balsam, bananas caoutchouc, vanilla, copal, coffee, cotton sugar, potatoes, and tobacco. Amongst its indigenous animals may be mentioned the llama (the beast of burden), alpaca, vicuña, guanaco, chinchilla, viscacha. All forms of S. Amer. bird life are found here.

Minerals and vegetable produce. B. is still famous for its silver-mines, but tin is now the most valuable mineral, constituting in value 90 per cent of B.'s exports. One quarter of the world's supply of tin is now mined in B. Other metals which are found in large quantities are antimony, copper, and gold; lead, mercury, bismuth, zinc, and iron are also found in fair quantities. In the S. provs. salt is found in large quantities, but coal appears to be rare. In the S. is a petroleum-bearing country of great promise. Production in 1954 was 1,700,000 barrels. Amongst the other products of the country may be mentioned wheat, barley, and other cereals, the production of which is, however, retarded, as is agriculture generally, by the lack of a good system of communications. The lower zone is remarkably adapted for the production of maize, cotton, and tobacco, but these industries are not developed. The chief agric. products, besides cereals, are potatoes, highland rice, cacao, coffee, and rubber. In 1954 B.'s total exports were valued at some \$31,000,000, and imports some \$20,100,000.

Communications. The internal communications are in general bad, in some parts of the country bridle roads forming the only means of transport. Railways are beginning to be developed, and there are now 1862 m. of railway in the country (over 1040 of which are state-owned). The prin. line is the Antofagasta and Bolivian railway (total length in B., 744 m.). Under a treaty with Chile (1904) the Arica-La Paz line (276 m., of which 150 m. are in B.) was built from La Paz to Corocoro. Two treaties concluded with Brazil in 1938 provide for joint construction of a railway from the dept of Sta Cruz de la Sierra to a point near the riv.-port of Corumbá in Brazil. By means of the railways which run through Peru to Mollendo, and through Chile to Antofagasta and Arica, B. exports its minerals, which form four-fifths of its total export. Another railway which has been of great use to B. is the Madeira-Mamoré line of Brazil, which, by circumventing the 200 m. of rapids on the Madeira R., enables the riv. system of N. B. to be linked with the Amazon and the Atlantic. Rubber and timber are transported by this route. Tupiza in the far S. is connected to the Argentine railway system, and in the SE. there is a small port, the Puerto Suárez, on the R. Paraguay. Steam boats are employed

on Lake Titicaca and the R. Desaguadero, and commercial aviation is well developed.

Constitution, etc. The first constitution was dated Oct. 1880. A new one in 1938 vested the executive in a president elected for 4 years, and not eligible for re-election until 4 years after his term had ended. There is a bi-cameral congress consisting of a senate of 27 members elected for 6 years, and a chamber of 110 deputies elected for 4 years. Under a constitution adopted in 1945 the presidential term was extended to 6 years; but a revolution of July 1946 largely overturned it. The congress elected in 1947 was charged with the task of revising the 1945 constitution. B. is divided into 9 depts. Owing to early rivalries, it has what amounts to 2 caps., Sucre being nominally the cap. and La Paz the actual seat of gov. Both have univrs., that at Sucre, founded in 1624, being one of the oldest in America. The state religion is Rom. Catholic, but the principle of toleration is accepted. Education is free and supposed to be compulsory, but is in a somewhat backward state. There are, however, nearly 1600 elementary schools and 27 colleges for secondary education. Military service is compulsory, and there is a small standing army (national guard).

History. At the time of the Sp. conquest in the 16th cent. B. was part of the Inca empire. Ruins at Tiahuanaco, S. of Lake Titicaca, testify to a still earlier civilisation, that of the Aymaras. Under Sp. rule it formed part of the viceroyalty of Peru, being known as Alto Perú, or Charcas. The silver mines of Potosí gave it then a position of great importance. In 1776 it was separated from Peru and added to the viceroyalty of Buenos Aires. In the war of Independence, 1810-24, the royalists long held their ground here, but were finally defeated at the battle of Ayacucho. Independence was gained in 1825. Union with the Argentine provs. was declined, and the rep. of B. was formed, its constitution being framed by Bolívar, and Sucre becoming the first president. On Bolívar's departure, however, the constitution was overthrown and civil wars and party strife broke out. In 1838 there seemed some prospect of B. allying itself with Peru. Strained relations with Chile, arising from the working of the guano beds of the Pacific coast, were adjusted in 1866. In 1879 B. and Peru entered into a 4 years' war with Chile, which ended in their defeat. A frontier dispute with Brazil was settled in 1903, Brazil then undertaking to build the Madeira railway. In the first 10 years of this cent. B.'s exports increased in value 235 per cent, and this was still further augmented by the great demand for minerals during the First World War. In 1917 B. severed relations with Germany. Increased prosperity brought greater tranquillity for a time, but in 1928 a boundary dispute with Paraguay, its S. neighbour, brought both nations to the verge of war. The dispute was, however, submitted to an international commission for mediation in 1929.

The political situation in B. became unsettled owing to the autocratic gov. of Dr. Hernando Siles, who was elected president in 1926. In that year he suspended various civil rights which had been assured to the people by the constitution, and by an arbitrary decree invested himself with dictatorial powers, formed a ministry of his own adherents, and amended the constitution to secure his re-election. His obvious intention to continue to rule B. at all hazards caused a revolution in 1930, which, begun by students and workmen, was taken up later by the mob in La Paz and at length supported by the army, with the result that Dr. Siles had to escape from his residence on the heights overlooking the cap., while the military directorate, under Gen. Blanco Gallardo, took the reins of gov. The return to civil gov. took place early in 1931, the provisional gov. holding a presidential election, when Dr. Daniel Salamañca, the nominee of both liberal and republican parties, was elected. Various constitutional changes, designed to decentralise the gov., were carried through. It was hoped to make the estab. of dictators more difficult, but indeed the hist. of B. shows that the country has had no fewer than 70 dictators from the time of Santa Cruz in 1828, while the long bitterness of the Chaco war with Paraguay was not calculated to make the path of the liberal elements easier. The Chaco war began in 1932—though the dispute over the boundaries is of 50 years' standing—and dragged on intermittently for some years. In 1933 the League of Nations, on the suggestion of the belligerents, invited the Argentine to mediate together with Peru and Chile; but these nations declined to intervene. The war actually ended in 1935 (Oct.) when Paraguay, by the peace treaty, ceded to B. a free zone at Port Casado on the Paraguay R. But this did not really end the dispute, and the underlying cause of the war was removed only when Argentina agreed to grant landlocked B. an outlet for her oil through Argentina. In 1937 a bloodless coup was carried out by malcontents in the army, who ousted the provisional president, David Toro, and installed Col. German Busch, Chief of the General Staff, in his place. Not long afterwards the Cabinet decided to give up experiments in State Socialism, to reinstate the 1880 constitution, and to return to a democratic republican form of gov. The parliament elected in 1938 had 103 members, and almost all were members of the United Socialist Front. This parliament adopted a new constitution in May 1938, and then adjourned for a long time. Though the cabinet at this time was predominantly Socialist, the so-called Socialists were in fact a kind of fascists, and B. was then virtually under a military dictatorship. Some social legislation was passed, but there was no attempt to nationalise wealth. In Aug. 1939 President Busch was shot mysteriously and succeeded by Col. Quintanilla, who, in 1940, gave place to Gen. Penderanda.

Probably the general opinion of the country was anti-Axis. At all events in Mar. 1942 B. broke off relations with the Axis powers, and in April, a year later, declared war on them. A revolutionary movement under the National Revolutionary party, together with army officers overthrew President Penaranda in Dec. 1943, the ostensible reason being opposition to the suspension of the municipal elections and of all constitutional guarantees. A new gov. was formed under Maj. Villaroel, deputy chief of the Bolivian general staff. Victor Paz Estenssoro was elected president in May 1951, and after some resistance by a military junta, assumed office definitively on 9 April 1951. Hernán Siles became president in 1956.

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Boliviano, monetary unit of Bolivia. The silver B., nominally worth 1s. 7½d., is divided into 100 centavos.

Boll, old Scottish measure, used for grain. It is still in vogue in many parts of Scotland, although it is not recognised by law. It is used also in the N. cos. of England and in the Isle of Man. The wheat B. is the equivalent of 4 or 4½ bushels, and this answers for peas, beans, etc. The potato B., however, is from 8½ to 9 bushels. A B. of flour or meal is supposed to be 140 lb. avoirdupois. A B. of land is about a Scottish acre; a B. of canvas measures 35 yds.

Boll Weevil, or **Boll-worm**, name given to the larvae of various noctuid moths which attack the bolls or seed pods of the cotton plant. The common B. W. (*Heliothis armigera*) is a serious pest not only of cotton, but of many other cultivated crops in America, Asia, and Africa. The cotton weevil, which, during the last 40 years, has become such a serious plague in America, is a minute insect, the adult beetle attaining a maximum length of about ½ in., half of which is its long proboscis used for boring purposes. The eggs are laid in the buds of the cotton plant during the spring, and after passing through the larval and pupal stages, become adults capable of breeding in 2 or 3 weeks (the period of development from egg to adult; the adult, thereafter, begins to breed in about 5 days). In the winter hibernation of the beetles takes place in fields, outhouses, and rubbish heaps.

Bollandists, see **BOLLANDUS**, **JOHN VAN** and **ACTA SANCTORUM**.

Bollandus, John van (1596–1665), Jesuit of the Low Countries, has given his name to the Bollandists, a Jesuit association by whom the *Acta Sanctorum*, a collection of the lives of the saints of

the anct Roman and Greek and the modern Rom. calendar, has been pub. B. took up the work at the death of Heribert Rosweyd of Bois-le-Duc, who had already conceived the idea and d. in 1629. B. settled in Antwerp and associated himself, personally and by correspondence, with Jesuits all over Europe, enlarging the scope of the work as he amassed fresh material. In 1643 he issued the 2 vols. for Jan., and in 1658 the 3 for Feb., the work being continued after his death, and still in course of pub.

Bollène, Fr. tn in the dept of Vaucluse, with a trade in pottery, flour, and card-board. Pop. 5200.

also known as Giam B., whilst the French call him Jean de Douai. Among his numerous works may be mentioned 'Samson killing the Philistines'; 'Statues of the Rivers Nile, Ganges, and Euphrates'; 'Neptune and Four Sirens,' for the public fountain of Bologna; a bronze 'Mercury,' at Florence; and the 'Rape of the Sabines,' also at Florence. See A. Desjardins, *La Vie et l'Œuvre de Jean Boulogne*, 1883.

Bologna: 1. Prov. of Italy, in central Emilia-Romagna (q.v.). It has a plain in the N., but its S. half contains mts of the N. Apennines (q.v.). Rivs. include the Idice, Savena, and Reno. The prov.



Bollington, tn of Cheshire, England, 3 m. N. of Macclesfield. Pop. 5320.

Bolo Pasha (Paul Bolo) (d. 1918), Fr. traitor, b. Réunion, who came to Paris and from an early age lived on his wife. He undertook sev. businesses, but they all failed. In 1905 he bigamously married a rich widow and lived lavishly in Paris; was imprisoned for financial fraud; created pasha in 1915 by the ex-khedive, to whom he proposed various financial schemes. During the First World War he turned traitor, being employed by Germany to influence the Fr. press in favour of a separate peace so that Germany would be free to attack England. He was brought to trial, sentenced to death, and was shot at Vincennes, 17 April 1918.

Bologna, Giovanni da (1524-1608), Fr. sculptor and architect, b. Douai; studied at Rome. He went to Florence, and in 1558 was attached to the court of the Medici as sculptor. He married at Bologna, and then took the name by which he is known, G. da B., having formerly been known as Jean Bologna. He is

is mainly agric. and produces rice and silk. The prin. tns include B., Castel San Pietro, and Imola (qq.v.). Area 1430 sq. m.; pop. 785,000.

2. (Etruscan Felsina; Rom. Bononia), It. city, cap. of the prov. of B., and chief tn of Emilia-Romagna, 185 m. N. by W. of Rome (q.v.). It stands at the foot of the Apennines. Etruscan in origin, B. was later an important tn of the Boii (q.v.). In 189 BC it became a Rom. colony. After the fall of the W. Empire, it was taken by the Longobards and the Franks (qq.v.). In medieval times it was a free city, and adhered to the Guelph faction (see GUELPHS AND GIBELLINES). It then passed under the domination of the Visconti (q.v.) and the Bentivoglio (see BENTIVOGLIO, GIOVANNI), and in 1506 became part of the States of the Church (q.v.). It continued in papal hands (except for the period of the Cisalpine Rep., q.v.) until 1860, when it became part of united Italy. During the Second World War the allied armies began their final assault S. of B. on 9 April 1945, and within 10 days were on the outskirts of

the city. The city was taken on 21 April (see ITALIAN FRONT, SECOND WORLD WAR CAMPAIGNS ON). The suburbs of the city suffered severely, but on the whole B. escaped serious damage. The medieval walls, 5-6 m. in circumference, still exist, and the general appearance of the city has changed little since the 17th cent. There are many splendid medieval, Renaissance, and baroque palaces and mansions. The archiepiscopal cathedral (12th-18th cents.) has a baroque façade. Other notable churches are: S. Petronio (14th-17th cents.), a great Gothic basilica, still unfinished, containing beautiful frescoes; S. Domenico (13th cent.), which has a magnificent chapel containing the tomb of the saint (see DOMINIC); S. Stefano, a curious group of churches of different periods, linked by cloisters and courtyards; and the Gothic church of S. Francesco, which was seriously damaged in the war. The univ. of B., founded c. 1200, developed from its famous school of law. In the Middle Ages students travelled to it from all over Europe; its medical school laid the foundations of the modern study of anatomy, and claims to have been the first school to dissect the human body. Among those who have been connected with the univ. are Dante, Petrarch, Tasso, Copernicus, and Galvani (q.v.). Of the famous towers of the city the most remarkable are the slender *degli Asinelli* (1119) which is 320 ft high, and the *Garisenda* (1110) which is 160 ft high and leans 10 ft out of the perpendicular. B. has 2 important libraries, each with over 500,000 vols., an archaeological museum, and a picture gallery which is rich in the works of artists of the Bolognese school (see ITALIAN ART). Sev. popes, including Benedict XIV (q.v.), have belonged to B., and about 200 cardinals. There are manufs. of sausages, macaroni, pottery, machinery, leather goods, paper, and musical instruments. The city is an important centre of communications, and has a trans-Appennine railway connection (by means of a tunnel) with Florence (q.v.). Pop. (city) 233,000; (comm.) 349,300.

Bologna Stone, mineral originally found in clay near Bologna. It is one of the barytes group of minerals, and after being heated with charcoal, reduced to barium sulphide, and exposed to the rays of the sun it has phosphorescent qualities. This was one of the first observations of phosphorescence from inorganic matter.

Bolometer, instrument used to measure small differences in temp. and based upon the phenomenon that heat imparted to a metal increases its resistance to electricity. It was invented in 1880 by Samuel P. Langley, an Amer. physicist, who sought a more efficient instrument than the thermopile. The B. consists of a thin strip of platinum foil blackened with lamp-black and arranged to form one arm of a Wheatstone bridge, while a strip of similar resistance constitutes the other arm. The blackened strip alone is exposed to the heat rays, and the slightest increase in temp. decreases its conductivity; the equilibrium of the bridge is

therefore disturbed, and the extent of such disturbance is indicated by the deflection of the connected galvanometer. In order to attain great delicacy, the platinum strips are made exceedingly small in section, being sometimes $\frac{1}{16}$ in. wide and $\frac{1}{3200}$ in. thick. With such an instrument the inventor discovered an extension of the infra-red rays of the spectrum which could not be detected by any other instrument. It has also been used to estimate the intensity of the energy of radiant heat. After being exposed to radiation for a measured time, the rays are cut off and the increase of current necessary to produce the same increase of temp. noted. The B. has also been employed in wireless telegraph receiving apparatus. The platinum in this case is in the form of a loop of fine wire enclosed in an exhausted glass bulb after the manner of an electric incandescent lamp. Electric oscillations passing through the bulb increase the resistance of the wire and thus cause the galvanometer to deflect.

Bolor Tagh, lofty ridge of mts on the border of the Pamir plateau in central Asia. The ant kingdom of Bolor was once close to the B. T.

Bolsena (ancient Volsinii), It. tu. in Lazio (q.v.), at the N.E. corner of the Lake of B. It has Etruscan (see ETRUSCAN) remains, but is thought to be the Rom., not the Etruscan, Volsinii (see ORVIETO). There is a 12th-cent. castle; in the 11th-cent. church of Santa Cristina there took place, in 1263, the 'Miracle of Bolsena,' a miraculous bleeding of the consecrated Host. Pop. 4800.

Bolsena, Lake of (It. Lago di Bolsena; ancient Lacus Volsinensis), It. lake, in Lazio (q.v.), 8 mi. N.W. of Viterbo (q.v.). Its basis is a volcanic hollow, and its shores are considered unhealthy though beautiful in scenery. Area 44 sq. mi.

Bolshevism (from the Russian *bol'she*, more), radical trend in the Russian Social Democracy which later developed into a system of totalitarian dictatorship, the first successful modern totalitarian movement (see also FASCISM). The founder and main representative of B. was Lenin (q.v.), whose ideas and activities dominated B. to such an extent that it is often considered identical with Leninism; there were, however, other trends in B., the most important of which was Bogdanovism (see BOGDANOV). As early as 1920 Stalin described Leninists as that group of Marxists which switches the centre of gravity of the problem from the outward recognition of Marxism to its implementation: 'designing ways and means of realising Marxism which correspond to circumstances, changing these ways and means when circumstances change—that is what this group primarily pays attention to.' Apart from Marxism, the main theoretical sources of B. were the teaching of Chernyshevskiy (q.v.) on the role of the peasantry in a Russian social revolution, and the views of the Jacobin wing of Russian Populism (q.v.) who believed in the seizure of state power by a revolutionary minority in order to use the state

machine for the implementation of radical reforms. Starting from basic Marxist principles, B. maintains that the proletariat cannot spontaneously evolve either a socialist ideology or organisational forms necessary for bringing about a socialist revolution. The correct socialist ideology must be inculcated into the proletariat by the radical intelligentsia (q.v.), who also provide the initial cadres of professional revolutionaries and train workers suitable for this role. The problems of organisation and tactics of the party built around a core of professional revolutionaries, and of the mass organisations led by the party, occupy a central place in the theory of B., and the manner in which these problems are dealt with is the main contribution of B. to political theory in general. The problems of the Dictatorship of the Proletariat (q.v.), and the role of the Soviets (see SOVIET) and the trade unions were solved in accordance with the basic view on the role of the party. A further extension of the Marxist theory was the adaptation and reinterpretation by Lenin of J. A. Hobson's theory of imperialism; according to Lenin, Russia had reached the imperialist stage, which was the last stage in the development of capitalism, and was thus ready for a socialist revolution. After Lenin's death Stalin further developed the theory of B., combining Leninism with National B. (q.v.) which originally had nothing to do with B. or with Marxism in general, and was indeed hostile to it. The main contributions of Stalinism (q.v.) to the theory of B. were the idea of building socialism in one country first by way of its industrialisation, collectivisation of agriculture (q.v.), creation of a new Bolshevik intelligentsia to replace the old one, the Stalinist conception of the Soviet society, the theory of the moral and political unity of the Soviet people, the doctrine of Socialist Realism (q.v.), and the theory that the class struggle sharpens rather than diminishes after the estab. of a socialist society. At first very realistic, the theory of B. already in Lenin's lifetime incorporated a number of myths, and under Stalin degenerated into a series of largely fictitious dogmas.

The name B. originated from a majority obtained by Lenin at the end of the Second Congress of the Russian Social-Democratic Labour party (q.v.) in 1903, when sev. delegates had left the congress. But the main principles of B. had already been elaborated by Lenin since the 1890's in the struggle against the so-called 'Legal Marxists' and 'Economists' (q.v.), and implemented in the activities of the *Iskra* (q.v.) organisation formed by Lenin in 1900. After 1903 B. existed as a more or less organised faction (or a number of warring subfactions) within the Social-Democratic party until 1912, when the Leninists separated themselves from all other Social-Democratic trends, and formed an independent Bolshevik party. They retained the name 'Social-Democratic Labour party (Bolsheviks)' until 1918, when it was replaced by the name of 'Communist party (Bolsheviks)'; the word 'Bolsheviks' was dropped in 1952,

and the term B. is now used in Russia only in an historical sense.

The Bolsheviks took an active part in the revolution of 1905 (q.v.), but their real chance came after the Feb. Revolution (q.v.) in 1917, when the successive democratically minded coalition govs. (see PROVISIONAL GOVERNMENT) proved unable to provide the leadership necessary for a democratic reorganisation of the country in the middle of a war. In the autumn the Bolsheviks achieved a majority in a number of important Soviets, and with the help of the Red Guards (q.v.) they seized power on 7 Nov. (see OCTOBER REVOLUTION). For further hist. of B. see CHEKA; CIVIL WAR, RUSSIAN; COMINFORM; COMINTERN; COMMUNIST PARTY OF THE SOVIET UNION; CONSTITUENT ASSEMBLY, RUSSIAN; FIVE-YEAR PLANS; GREAT PURGE; LEFT OPPOSITION; MENSHEVIKS; NEW ECONOMIC POLICY; RIGHT OPPOSITION; RUSSIA, *History*; WAR COMMUNISM. See B. Russell, *Practice and Theory of Bolshevism*, 1920; H. J. Laak, *Communism, 1381-1927*, 1927; V. I. Lenin, *Selected Works* (12 vols.), 1936-7; J. Stalin, *Leninism*, 1940; R. N. Carew Hunt, *Theory and Practice of Communism*, 1950 (revised 1957), and *Communism Past and Present*, 1954; M. Fainsod, *How Russia is Ruled*, 1950; J. Plamenatz, *German Marxism and Russian Communism*, 1954; L. H. Haimson, *The Russian Marxists and the Origins of Bolshevism*, 1955; L. Schapiro, *Origin of the Communist Autocracy*, 1955; D. Treadgold, *Lenin and his Rivals*, 1955.

Bolsover, tn in Derbyshire, England, 6 m. E. from Chesterfield, and situated upon a ridge of the Pennines. There are coal-mines in the neighbourhood, also quarries of limestone. B. Castle, which is well preserved, is a very ancient structure built in the 11th cent. Pop. 10,750.

Bolsover Stone, name given to the yellow limestone found at Bolsover in Derbyshire. It was selected for its strength, durability, and colour for the construction of the Houses of Parliament.

Bolsward, small tn in the prov. of Friesland, Netherlands, 16 m. SW. of Leeuwarden. It is situated at the junction of some canals. It trades in dairy produce and cattle, and is noted for the manuf. of worsted. The National Central Dairy School is at B. There are shipbuilding yards, brickyards, and potteries. Pop. 8100.

Bolswert, Shelte & (1586-1659), Dutch engraver, b. Bolsward, lived at Antwerp. He was one of many who found employment in reproducing the work of Rubens, after whom he engraved more than sixty plates. He also engraved works of Seghers, Jordaens, Quellin, Diepenbeek, Rombouts, and Van Dyck, the latter's 'Crucifixion' being one of his best productions.

Bolt Head, cape on the S. coast of Devon, W. of the estuary of the Avon R. It is 400 ft high, and was acquired in 1928 by the National Trust.

Boltenia, genus of tunicates found in Australasia, the Arctic, and N. Atlantic. It belongs to the order Ascidiacea and

family Cynthiidae. The species, which includes *B. ovifera*, *B. fusiformis*, *B. reniformis*, and *B. globifera*, remains fixed to rocks and stones by the long stalk of the body, and shows few signs of life.

Bolthead, or receiver, or mattress, a glass vessel used in chemical distillations. It is long in shape, with a straight neck.

Bolton, Duke of, Eng. title held by the Paulet family from 1689 to 1794. It was first conferred upon Charles Paulet (or Powlett), Marquess of Winchester, in recognition of his services in the revolution of 1688. The title became extinct after the death of the 6th duke in 1794.

Bolton, Sir Francis John (1831-87), soldier and electrician. He enlisted in the Royal Artillery, and became captain of the 12th Foot Regiment, 1860. With Colomb he developed a system of visual signalling, also inventing oxy-calcium light for night-signalling. With Colomb and an officer of the Royal Engineers he compiled the *Army and Navy Signal Book*, used in Abyssinian campaign, 1867. One of the founders of the Society of Telegraph Engineers and Electricians, 1871. Wrote *London Water-supply*, 1884.

Bolton, Sir Richard (c. 1570-1684), lawyer, practised as a barrister in England and Ireland; in 1604 became recorder of Dublin. In 1621 he pub. *Statutes of Ireland* (from Edward II to James I); chief baron of Irish exchequer, 1625; 1639, became chancellor of Ireland. He was one of Strafford's chief advisers on introducing arbitrary gov. In 1643-4 he was chief counsellor of Ormonde, negotiating for cessation of hostilities between English and Irish, and in 1646 he signed the proclamation of a treaty of peace between Charles I and his Irish Rom. Catholic subjects. See *Contemporary History of Affairs in Ireland, 1641-52*, 1879; Carte's *Life of Ormonde*, 1736; Carte MSS., Bodleian Library.

Bolton, municipal and parl. bor. of Lancs, England, on the R. Croal, 10 m. from Manchester and 200 m. from London, with an area of 15,279 ac. B. ranks as the fourth largest tn in Lancs, following Liverpool, Manchester, and Salford in size and importance. There are over 500 ac. of parks and recreation grounds, and a number of imposing public buildings, notably the tn hall and civic centre, and the technical college. B. School, founded originally in 1524, is a public school for boys. Here is the old 'Man and Scythe' Inn; 2½ m. NW. is Smithills Hall (15th cent.), and Deane, 1½ m. from B., has an interesting church. Hall i' th' Wood, a fine example of late 15th-cent. and 16th cent. architecture, was presented to the tn in 1889 by the first Viscount Leverhulme, and is now open as a museum. It was the home of Samuel Crompton, who in 1779 invented the spinning mule and revolutionised the spinning industry. Sir Richard Arkwright, inventor of the spinning-frame (1768), also lived and worked for a number of years in B. B. is the centre of the fine-cotton industry, but there is a diversity of other trades, including general and machine engineering, constructional

engineering, and leather tanning. The textile industry is the most important and comprises cotton-spinning and weaving, the manuf. of artificial silk goods, and bleaching, dyeing, and finishing. B. returns 2 members to Parliament. Pop. 165,600.

Bolton Abbey, priory situated on the banks of the Wharfe R., in the W. Riding of Yorks, England. It was founded in 1121 by Wm de Meschines and Cicely de Romili, his wife, for the order of St Augustine, about 2 m. from its present site. The removal took place in 1151, but it was dissolved in 1540. A portion of the nave has been used as a par. church since c. 1170, but the tower, choir (with a very fine E. window), and transepts are practically all that is left of the building. The ruins are so hidden in woods that they are not noticed until the visitor is very close. The surrounding scenery is most beautiful. Wordsworth founded his poem *The White Doe of Rylstone* upon a legend connected with the old abbey.

Bolton upon Dearne, see DEARNE.

Boltraffio, or Beltraffio, Giovanni (1467-1516), It. painter and a pupil of Leonardo da Vinci. He came of a distinguished Milanese family, and for most of his life occupied various civic offices in Milan. Girolamo Casio, early in B.'s artistic career, was closely associated with B., as his portrait in the Brera Gallery (Milan) and his 'Madonna' in the Louvre show. The National Gallery has sev. works of B., notably a Madonna and Child, considered by Morelli to be B.'s best painting. There are a number of fresco medallions of holy women by B. in the nuns' choir of S. Maurizio, Milan. See Vasari, *Lives of the Painters, Sculptors, and Architects* (Everyman's Library); H. Grimm, *Life of Michael Angelo*, trans. by F. E. Bunnott (vol. i), 1896; Suida, *Leonardo und sein Kreis*, 1929.

Boltzmann, Ludwig (1844-1906), Austrian physicist, b. Vienna. He studied with Stefan in Vienna; made prof. in Graz (1869), and in Munich (1889). He gave a theoretical explanation on the basis of thermodynamics of Stefan's Law (see RADIATION) and made important contributions to the kinetic theory of gases. Maxwell and B. derived the distribution of velocities of molecules in a gas, and showed that the average kinetic energy per molecule is a multiple of $kT/2$ where T is the absolute temp. (q.v.) and k is known as B.'s constant.

Bolus, round mass of substance with medicinal qualities. It is soft and larger than a pill, though it is intended to be swallowed in the same way. The term is also applied to a mass of food about to be swallowed or a mass passing along the alimentary canal (q.v.).

Bolyai, Janos (1802-60), Hungarian mathematician. His father Fathas B. was a fellow student of Gauss (q.v.) at Göttingen. B. was educ. at Vienna Univ. and joined the army in 1823. His celebrated theory of parallels, which played so important a part in the hist. of non-Euclidean geometry (see GEOMETRY, Non-Euclidean Geometry), was written 1825-9,

and originally appeared as an appendix to one of his father's mathematical works *Tentamen* . . . in *Elementa Matheseos Puræ*, 1832. B.'s appendix was sub-headed 'exhibiting the absolutely true science of spaces, independent of Axiom XI of Euclid (not to be decided *a priori*), with the geometrical quadrature of a circle in the case of its falsity.'

Bolzano: 1. Prov. of Italy, the N. part of Trentino-Alto Adige (q.v.). It is in the S. Tirol (q.v.), and a high proportion of the people are Ger. speaking. The prin. tns include B., Merano, and Bressanone (qq.v.). Area 2015 sq. m.; pop. 349,000.

2. (Ger. **Botzen**, or **Bozen**), It. tn, cap. of the prov. of B., at the confluence of the Talvera and the Isarco, 32 m. NNE. of Trent (q.v.). It is on the railway to the Brenner Pass (q.v.), and due to its strategic position suffered severe damage during the Second World War. There is a cathedral, and there are sev. medieval churches of interest, as well as palaces and monasteries. There are textile and flour manufs., and a trade in agric. produce, wine, and fruit. Pop. 77,000.

Boma, port of the Belgian Congo, formerly the cap. It is situated on the r. b. of the R. Congo, at about 40 m. from its mouth. Pop. 5000.

Bomarsund, vil. on Åhrenanmaa Is. (q.v.), now part of the rep. of Finland. Formerly under Russian rule, it was the site of a fortress commanding the Gulf of Bothnia. It was taken by the French and English on 16 Aug. 1854, who destroyed it after a bombardment lasting a week. The treaty of Paris bound the Russians not to rebuild it, and the Finnish Rep. is also under obligation to demilitarise the zone by treaty with Russia (1940).

Bomb (in warfare), originally a hollow ball or 'shell' filled with explosive and projected from special types of artillery; the term was also applied to an explosive missile or grenade (q.v.) thrown by hand, and also to any device deposited in a place where it would destroy life or property by means of an explosion. In recent times the word has been used with these meanings, and also as a general term for projectiles dropped from aeroplanes, whether designed to produce destruction by explosion, by fire, or by poison gas. With the advent of the pilotless aeroplane and guided missile carrying a charge of high explosive which is detonated as the aircraft dives and collides with its target, the word has received a natural extension of its meaning, and such weapons are called flying B.s. Still other B.s are launched and propelled by rocket action.

Aerial B.s consist of a container or case filled with high explosive, an incendiary mixture, or poison gas, and some means of detonating, igniting, or discharging the filling. *High-explosive B.s* resemble shells in being filled with T.N.T. (trinitrotoluene) or lyddite (trinitrophenol). B.s are usually streamlined, and tail fins are provided to increase their stability and accuracy in falling, causing the B. to

rotate while falling, the end of the percussion cap remaining downmost. High-explosive B.s for use against warships or land targets that are strongly protected by reinforced concrete, etc., may have a heavy case designed to penetrate the protective structure, so that the explosion occurs inside. These are fitted with a fuse with a slight delay action, and to be effective they must either be dropped from a great height, with a consequent loss of accuracy, or their penetrating power must be increased by a rocket propulsion unit fitted in their tails. Rocket-propelled B.s of smaller size have also been used extensively for attacking tanks and other vehicles, whose movements make them a difficult target for B.s dropped in the usual way. For use against tns and factories B.s need not have high penetrating power, and their cases are made comparatively light so that a larger weight of explosive can be used. The damage caused to buildings by high-explosive B.s is largely the result of blast (high-pressure atmospheric waves) and of earth tremors similar in nature to those of earthquakes. Since the total B. load of an aeroplane is higher if it carries a few large B.s rather than a larger number of small ones, there has been a tendency for larger and larger B.s to be used, the largest size being limited by the lifting capacity of the aeroplane. Thus, although few B.s heavier than 1000 lb. were used before 1941, 20,000-lb. B.s were dropped for special purposes a few years later (see **Block-Buster**). *Incendiary B.s* are usually small, as the object is to produce simultaneously a larger number of fires than can be dealt with by the defence organisation. Some incendiary B.s are made of magnesium, which, being a solid metal, requires no external case. The fillings of incendiary B.s usually consist of thermit (a mixture of aluminium powder and iron oxide), which evolves enormous heat when ignited. Oil is sometimes added in order to widen the conflagration, the action of thermit being localised. An incendiary mixture and high-explosive may be combined in the same B. *Petrol B.s* are used to fire easily inflammable objectives, such as forests, wooden buildings, or ripe crops. *Smoke B.s*, intended to produce dense screens of smoke, contain phosphorus, stannic chloride, fuming sulphuric acid, chlorosulphonic acid, or a mixture of zinc dust and carbon tetrachloride. *Atomic and Hydrogen B.s*, although not particularly large, create extraordinarily powerful blast effects. They also act as incendiaries over a wide area because of the heat radiated, and endanger life both for these reasons and because they produce burns by direct radiation. The radioactive materials released by them may also be highly dangerous. (See **ATOMIC BOMB**.)

Although the aerial B. was of relatively minor importance in the war of 1914-18, it proved one of the decisive weapons 25 years later. The Allies dropped in the European theatre of operations nearly 1,400,000 tons of B.s in 1944 alone, and

the havoc produced by their sustained bombing offensive was a major cause of the Ger. collapse in the following year, while the Jap. surrender a few months later was precipitated by the first use of atomic B.s dropped on Nagasaki and Hiroshima, resulting in casualties numbering some 100,000 killed and missing.

Bomb, in geology, name applied to a round mass of lava ejected from the crater of a volcano.

Bombaceae, family of dicotyledonous plants consisting of large trees in the tropics, mostly America. The flowers are hermaphrodite, have 5 joined sepals, 5 free petals, 5 or more stamens either free or joined to form a tube, 2 to 5 superior joined carpels, which are multicelled, and contain 2 or more ovules in each cell. The fruit often contains hairs which form a cottony substance, but are too short to be made into linen. The chief genera are *Adansonia*, *Bombax*, *Durio*, *Ochroma*, *Fachira*, and *Quararibea*.

Bombard, early form of cannon, introduced before the 15th cent., which could throw stone balls from 250 to 500 lb. in weight. The B.s were muzzle-loaders, thick, and with a wide aperture, sometimes made of wrought-iron bars hooped together.

Bombardier, non-commissioned officer in the Royal Artillery, corresponding to corporal in the line regiments. The title has now no special implication, though the rank is still equivalent to that of corporal. The name owes its origin to the bombard (q.v.). A man employed in looking after bombards, howitzers, mortars, etc., was known as a B.

Bombardier Beetle, popular name of sev. species of coleopterous insects of the family Carabidae. They obtain their name from the fact that they can emit explosively from their bodies, when alarmed, a pungent, acrid fluid. A report follows the discharge, and the fluid instantly evaporates. *Brachinus crepitans* is the commonest Brit. species and occurs in chalky dists.

Bombardment, attack upon a fort, tn, fortress, etc., by means of continuous artillery fire. A B. consists historically in a continuous attack on the buildings and undefended portions of a tn in order to harass the civil pop., and so bring pressure to bear upon the governor or commandant of the tn to induce him to surrender. A B. used in order to produce psychological pressure on the inhab. was, even before the war of 1914-18, condemned as immoral. The Hague Convention Law of War (1907) laid down the following articles in connection with B.: Art. 25. The attack or B., by whatever means, of tns, vills., dwellings, or buildings, which are undefended, is prohibited. Art. 26. The officer in command of the attacking force must, before commencing a B., except in cases of assault, do all in his power to warn the authorities. Art. 27. In sieges and B.s all necessary steps must be taken to spare, as far as possible, buildings dedicated to religion, art, science, or charitable purposes, historic

monuments, hospitals, and places where the sick and wounded are collected, provided they are not being used at the time for military purposes. It is the duty of the besieged to indicate the presence of such buildings or places by distinctive signs, which shall be notified to the enemy beforehand. Art. 28. The pillage of a tn or place even when taken by assault is prohibited. An open tn is liable to be bombarded if it is in any way defended, or if the exigencies of military necessity demand it, i.e. if it can in any way be used by the enemy as a point of vantage. The main reason for a B. has already been given as a means of inducing the civil pop. to bring influence to bear which will lead to the ultimate surrender of the tn, but this has been proved to be not always successful. The case of the siege of Strasburg may be quoted as a case in point. The B. of a fort, tn does not of a necessity mean only the B. of the fortifications. The commandant of a bombarding force has the right to range his guns over the whole of the city, saving always those buildings which are mentioned in Art. 27. Notable historical B.s are those of Sebastopol, Strasburg, Paris, Soissons, and Verdun. Strasburg may be taken as the outstanding pre-1914 example of a tn that underwent a terrific B., as the tn was bombarded continually day and night. Later, when siege operations began, the fortifications were shelled all day, and the tn itself all night. When the surrender took place nearly 800 houses had been destroyed, considerably more than half of the total number of houses were injured more or less severely, 2000 of the civil inhab. killed, and over 10,000 made homeless. Many differences of opinion have been expressed on Art. 26, some authorities holding that B. should not begin until ample warning had been given the inhab., others that a besieged or threatened tn should be prepared for B. at any time without notice. During the First World War, B.s were normally directed against entrenched positions in the open. The high degree of skill attained in defending a position with obstacles, such as bomb-proof emplacements for guns and machine-guns, and the enormous increase in the proportion of the artillery necessitated B. to reduce the enemy's means of resistance. B. sometimes lasted for a few hrs. and sometimes for days, according to the strength of the position to be attacked or action it intended the enemy to take. When surprise is the important element, a B. of more than a few min. is seldom advisable in open warfare. After an initial blow has been struck and the value of surprise decreases, B. may be employed for attrition. The nature of the shell to be used depends upon the nature of the destruction in view, e.g. whether houses, forts, barbed wire, guns, transport, troops, etc. B. of tns from aircraft was first employed by the Germans, to which the Allies retaliated.

Aerial bombardment is covered by Art. 25 of the Hague Regulations (*supra*). The words 'by any means whatever' were added by the Second Hague Conference

so as to cover B. by aircraft. None the less, it was held by some jurists that, by analogy with naval B., railway junctions, munition factories, and the like might be bombarded from the air though situated in undefended places. All belligerents resorted to such B.s during the First World War, and still more was it the practice in the Second World War. Yet the question of law is still controversial.

In 1923, arising out of the Washington Conference of 1922 on the limitation of armament, a proposed code of air warfare rules was produced. The prin. were as follows: Aerial B. for the purpose of terrorising the civilian pop., of destroying or damaging private property not of military character, or of injuring non-combatants, is prohibited; aerial B. for the purpose of enforcing compliance with requisitions in kind or payment of contributions in money is prohibited; aerial B. is legitimate only when directed at a military objective, i.e. an object of which the destruction or injury would constitute a distinct military advantage to the belligerent; and such B. is legitimate only when directed exclusively at military forces, military works, military estabs. or depots, factories constituting important and well-known centres engaged in the manuf. of arms, ammunition, or distinctively military supplies; and lines of communication or transportation for military purposes. The B. of cities, tns, vils., dwellings, or buildings not in the immediate neighbourhood of the operations of land forces is prohibited. In cases where the objectives specified above are so situated that they cannot be bombarded without the indiscriminate B. of the civilian pop., the aircraft must abstain from B. In the immediate neighbourhood of the operations of land forces, the B. of cities, tns, vils., etc., is legitimate provided there is a reasonable presumption that the military concentration is important enough to justify such B., having regard to the danger this may cause to the civilian pop. A belligerent state is liable to pay compensation for injuries to person or to property caused by the violation by any of its officers or forces of these provisions. In short, these clauses substitute the test of military objectives for the obsolete distinction between defended and undefended places. In the resolution adopted by the general commission of the Disarmament Conference in July 1932 it was laid down that 'air attack against the civilian pop. shall be absolutely prohibited.' Yet the fact that neither this resolution nor the Hague Rules of 1923 have become part of international law does not mean that the matter is not governed by existing principles of law. For the immunity of non-combatants from direct attack is one of the fundamental rules of the international law of war, and it is a rule which applies with absolute cogency alike to warfare on land, at sea, and in the air. In the 1914-18 war the illegality, except by way of reprisals, of aerial B. directed exclusively against the civilian pop. for

the purpose of terrorisation or otherwise, seems to have been generally admitted by the belligerents. But this fact did not actually prevent attacks on centres of civilian pop. in the form of reprisals or of attack against military objectives situated therein. But in the ensuing world war the application of this principle of the law of war to air warfare was soon threatened by reason of the enlargement of the scope of and the changes in the character of modern total war which tends to obliterate the distinction between combatants and non-combatants; the resulting difficulty of determining what constitutes a military objective; and the technical difficulty of confining the effect of hostile air action to the intended or professed object of attack. See AERIAL WARFARE and AIR RAIDS.

Bombax, genus of Bombacaceae growing in tropical countries. It consists of large trees with a soft spongy wood frequently used for making canoes. *B. ceiba*, common silk-cotton tree, a native of W. Indies and S. America, reaches a height of 100 ft. The down in the seed-vessel is made into hats and bonnets, and is used for stuffing chairs and pillows. *B. malabriticum*, the cotton-tree of Ceylon and India, sheds its leaves in Dec. and flowers during the month it is leafless. *B. pubescens* attains a height of 20 to 30 ft, and in Brazil its tough bark is used in rope-making.

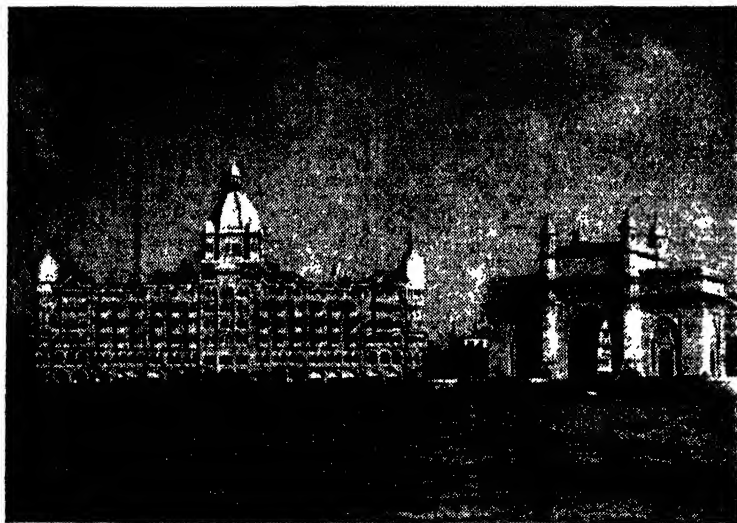
Bombay: 1. State of the Indian Union, situated on the W. coast, bounded on the N. by W. Pakistan and Rajasthan, on the E. by Madhya Pradesh, on the S. by Andhra Pradesh and Mysore and on the W. by the Arabian Sea. It has a varied climate, soil, and pop. The rich plains of Gujarat are watered by the Narbada and Tapi rvs. South, the state is divided by the W. Ghats into the coastal strip (the Konkan) and the Deccan highlands. In the NW. is the Kathiawar Peninsula (Saurashtra), a land of undulating low hills. The area gets most of its rain from the SW. monsoon—20 in. to 250 in. from June to Sept. The climate in the Deccan is agreeable, that of Gujarat and Kathiawar is very hot in summer, while B. Is. and the Konkan are only oppressive in May and Oct.

History. B. Is. was acquired by the Portuguese in 1509 and given to Charles II of England as part of the dowry of his Portuguese bride in 1661. Leased to the E. India Co. in 1668, in 1708 it became the H.Q. of the president of the company's organisation in this part of India and round it grew the Presidency of B. as areas were annexed following the wars with the Marathas. Last of all Sind (q.v.) was added in 1843. With large communities of enterprising Parsees, Bohras, and Gujaratis, B. early forged ahead in the business and industrial fields. 200 years ago a Parsee shipbuilder, Wadia, extended the shipyards, 100 years ago the cotton industry had its beginnings, a prominent figure in its early years being Tata, the Parsee to whom India later owed her first steelworks. B. Presidency also contributed to the Home Rule movement.

Tilak started preaching against Brit. rule in 1896. Constructive social and political reformers like Ranade, Gokhale, and Dadabhai Naoroji (a Parsee who became a Brit. M.P.) all hailed from this part of India, and Gandhi was born in Kathiawar and led his civil disobedience movements from Gujarat.

Sind was separated from B. in 1936, and in 1937 with prov. autonomy, B. had a Congress administration that functioned more satisfactorily than similar govs. in other provs. of India, and with independence the prov. was again happily

soil yields cotton, wheat, jowar, millet, and some sugarcane. Nagpur is noted for the loose jacket santra oranges. The Konkan is mainly rice land. Efforts are being made to develop coastal fisheries and the exploitation of sea foods. Industrially, B. City, Ahmadabad, Nagpur, Sholapur, and other cities produce over three-fourths of India's textile output, the factories employing half a million hands. B. City has important oil refineries, shipyards, motor assembly plant, and India's only atomic reactor plant. Engineering industries, chemicals,



Indian Tourist Information Office

BOMBAY: THE TAJ MAHAL HOTEL AND GATEWAY OF INDIA

spared the troubles of other areas. Sev. former princely states were merged into B. state before 1956, the chief being the Gaekwar's state of Baroda. In 1956 the Kanarese areas of the S. went to Mysore and B. was enlarged by the addition of the Maratha areas of the Nizam's Dominions and of the former Central Provs. (Madhya Pradesh) as well as of the whole of Saurashtra. The proposal to create separate Maratha and Gujarati states was given up owing to the rivalry over which state should have B. City and the disturbances which resulted.

Development. Though industrially one of the most advanced states, B.'s pop. is mainly dependent on agriculture. Main food crops are rice and wheat, jowar and bajri; and cotton, ground-nuts, and tobacco are the main cash crops. Gujarat's fine black soil yields Broach cotton—India's best. The black Deccan

sugar works, and vegetable cooking oil (vanaspati) factories employ many thousand hands, and Saurashtra is an important producer of cement. B. is the H.Q. of the Central Railway of the Indian railway network; B. Port is the most important in India; her airport at Santa Cruz is among the world's busiest.

Culture. B. is a bilingual state with 24 million Marathas and 16 million Gujaratis. Both Marathi and Gujarati belong to the Indo-Aryan group of languages with scripts akin to Devnagari (Hindi). Educationally the state is in the van of India. B. Univ. was estab. in 1857; other univs. are the Women's Univ. and the univs. of Nagpur, Poona, Ahmadabad, and Baroda. Increasing provision is being made not only for arts, but also for professional and technical courses.

Government. The governor is assisted by a council of ministers responsible to a

bicameral legislature with a Legislative Assembly of 396 and a Legislative Council of 72 members. In India's Parliament, B. State has 66 representatives in the Lower and 27 in the Upper House.

The cap. is Bombay (pop. 2,840,000). Other main towns are Ahmadabad (788,000) rivaling B. in its textile output; Nagpur (449,000) former cap. of the Central Provs.; Poona (481,000) the former Maratha cap. in the Deccan, now the site of India's Military Academy; Sholapur (266,000) with its cotton mills; Baroda (211,000) garden city and former cap. of the Gaekwars. The area is 188,240 sq. m.; pop. 47,800,000.

2. B. City, cap. of B. State, situated on a small is. which is connected with the mainland by an artificial causeway. It is the largest and safest harbour in India, and the most important. About 40 per cent of the total imports and exports of the whole of India pass through B. It occupies the best position for commerce in the whole of Asia, and after the opening of the Suez Canal, it rapidly surpassed Calcutta in its trade. The large and beautiful harbour (14 m. by 5 m.) is defended by numerous batteries, and contains 3 docks and a large dry dock. The Alexandra (50 ac.) is the largest dock in India. It has 3 docks, well equipped, and a large dry dock. Two large railway systems have their termini in the city and link it up with other commercial cities of India. At Malabar point is Gov. House. Between the Malabar and Comballa Hills rise the 5 towers of silence, where the Parsees deposit their dead. It was the Amer. war of 1861-5 that made the fortune of B., for it then became the chief cotton market of the globe. The name is a contraction of Bom Bahia, the Portuguese for good bay. Owing to its geographical position B. has been much influenced by the W. and since, under Brit. rule, Viceroys of India always first landed there, a large archway at the harbour entrance is known as the Gateway of India. In spite of suburbs expanding rapidly on the mainland, the tn of B. itself remains seriously congested, and the presence of cotton mills and other industry does nothing to relieve the situation. There are, however, fine public buildings and hotels, and every effort is made to maintain and increase the tn's amenities. It is the H.Q. of many big business houses including the world-famous industrialists, Tata's, whose hydro-electric works supply B. with power. The pop. is in the neighbourhood of 3,000,000.

Bombay Duck, or *Bummalow* (*Harpadon nehereus*), marine, pike-like fish of the family Harpadontidae. It is captured in the Indian seas and exported from Bombay in a dried state. It is used in curries.

Bombazine, material of which the warp is silk and the weft wool, though there is an inferior quality made of wool and cotton. The stuff is of fine texture, and is used in making the robes of some religious orders. Its manuf. was first introduced into England by the Dutch.

Bombelli, Raffaello, It. mathematician of the 16th cent., b. Bologna, and patronised by a bishop of Meldi. His main work is a *Treatise on Algebra*, 1572, in 3 books, the last being a set of problems. A hist. of algebra is prefixed to the works, in which the invention of the science is attributed to the Hindus. He is best known in connection with his improvement in algebraic notation.

Bomber. The first bomb-sight was invented by Lt. Riley Scott of the U.S. Army in 1911; but there were no real B. aircraft before the First World War. When the first air-raid was made against Ger. Zeppelin sheds and factories by pilots of the Brit. Royal Naval Air Service (R.N.A.S.) in 1911, they flew light reconnaissance aircraft, fitted with a 'pipe-rack' on the side of the fuselage, in which small bombs were held by pins through their fins.

It is generally accepted that the modern concept of the heavy B. had its beginnings in a demand by Adm. Sir Murray Sueter for a 'paralyser' for the R.N.A.S., which resulted in production of the twin-engined Handley Page 0/400 of 1917 and the later four-engined Handley Page V/1500. But the Germans were developing their famous Gotha B.s simultaneously, to take over the attack on England when losses of their Zeppelin airships became too heavy to sustain. Russia also operated a 'Squadron of Flying Ships' in the First World War, equipped with large *Ilya Mouromets* B.s developed from the world's first four-engined aeroplane, Igor Sikorsky's *Le Grand* of 1913. Before the end of that war, smaller single-engined day B.s, fighter-B.s, and torpedo-B.s were also in full service, and a specially armoured Sopwith Camel fighter had pioneered dive-bombing.

The next major advance came in the early 1930s, when the Amer. Boeing and Martin Cos. built the first streamlined monoplane B.s, culminating in the famous four-engined Flying Fortress of 1935, which pointed the way to later big B.s, notably the Brit. Lancaster and Halifax, and the Amer. Liberator and Superfortress, which served with distinction in the Second World War. In parallel, bombs were stowed internally instead of on external racks, and began to increase in size and destructive power, reaching a peak in the Brit. 22,000-lb. Grand Slam high explosive bomb and the U.S. atomic bombs. These weapons gave the B. command over the land and sea battles, and tactical atomic bombs are now small enough to be carried by single-seat aircraft from shore or naval carrier bases.

Great size is needed by the modern B. only when sufficient fuel has to be carried to reach distant targets, and the most efficient B.s of the mid-1950s are the medium-size Brit. Valiant, Vulcan, and Victor which fly so fast and high that they can elude virtually any defence system, each carrying a greater destructive force than all the B.s based in Britain in the Second World War added together.

The first supersonic B. is the Amer. Convair B-58 Hustler, capable of about 1200 m.p.h. and, like most modern B.s. able to be used also for photographic reconnaissance and as a 'flying tanker' to refuel other B.s. in mid-air during very long-range missions. Its alternative military loads are carried in a large container mounted under its fuselage. Already the first pilotless jet-propelled tactical B.s., refined successors of the Ger. V-1 flying bomb of 1944-5, are in service to supplement piloted B.s.; and intercontinental ballistic rocket missiles, able to carry a nuclear warload more than 5000 m. at 16,000 m.p.h. are under development as the ultimate B. aircraft. *See also* AEROPLANE.

Bombic Acid, *see* SILK.

Bombus, generic name for the social bees which are popularly known as humble-bees. They belong to the family Apidae of the order Hymenoptera, and form the largest of Brit. species. The prevailing colours are yellow, red, and black. *See* BEES.

Bombycidae, family of lepidopterous insects composed of small, dull moths with rudimentary maxillae, small palpi, no proboscis, and no frenulum. *Bombyx mori* is the true silkworm. *See also* SILK and SERICULTURE.

Bombycilla, term formerly applied to some species of birds in the family Bombycillidae known as waxwings.

Bombyliidae, family of dipterous insects distinguished chiefly by the long proboscis. The body is short, stout, and very hairy, and the legs are long, slender, and weak. The species are bee-like in appearance, and are remarkable for their great swiftness in flight, during which they emit a humming sound. *Bombylitus major* and *B. medius* inhabit Brit. woods and feed on nectar.

Bombyx, *see* SILK.

Bommelwaard, is. of the prov. of Gelderland, Netherlands, formed by the R.s. Waal and Maas, and containing the 14th-cent. castle-fortress of Loerestein. There are many small vills. on the is., as the soil is fertile.

Bomvanaland, dist. of Cape Prov. in S. Africa, part of Tembuland in Transkeian Ter.

Bon, Cape, most northerly point of the coast of N. Africa. It is on the Mediterranean Sea, 58 m. NE. of Tunis.

Bon Gaultier Ballads, name of a book of parodies of Tennyson, Mrs Browning, Macaulay, and others. 'Bon Gaultier' was the pseudonym of Sir Theodore Martin (q.v.) as a contributor to *Fraser's Magazine* and *Tait's Magazine*. In 1856 in conjunction with W. E. Aytoun (q.v.), he pub. *The Bon Gaultier Ballads*.

Bona, or Bône, seaport of Algeria in the dept. of Constantine, 140 m. W. of Tunis. It is situated at the base of a hill and enclosed by ramparts. Not much of the old tn remains, but the new tn is a prosperous Fr. city. Iron and phosphates are mined in the neighbourhood. Pop. 113,745.

Bona Dea (the good goddess), Rom. divinity, identical with the Gk Rhea

(Cybele). She is variously described as the sister, wife, or daughter of Faunus, and was herself called Fauna or Faula. She was worshipped at Rome as a chaste and prophetic divinity; her name was never heard in public, and she revealed her oracles only to females; nor was she ever seen by a man. For these reasons her festivals were celebrated only in the night by Rom. matrons in the houses of the highest officers of state. Her temple feast was on 1st May and the secret rites on the night of 3rd-4th Dec. (or May) at the house of the consul or praetor, as the sacrifices were offered on behalf of the whole Rom. people, the solemnities being conducted by the vestals. P. Clodius (q.v.) profaned the rites, entering the house of Caesar disguised as a woman, 62 BC.

Bona Notabilia, legal phrase designating goods of sufficient value to be accounted for. Where a man dies leaving goods of a sufficient amount in different dioceses, in order to prevent confusion arising from double administration, the metropolitan of the prov. (in pursuance of the jurisdiction over vills which anciently belonged to the eccles. courts) grants probate or letters of administration. The value necessary to constitute property B. N. was fixed by a canon of 1603 at £5.

Bonacci, Leonardo, *see* LEONARDO OF PISA.

Bonaire Island, or Buen Aire Island, most easterly of the Dutch W. Indian Is., situated off the N. of Venezuela, in lat. 12° 3' N. and long. 68° 25' W. Exports sisal. Area 98.45 sq. m.; pop. 5000.

Bonald, Louis Gabriel Ambroise, Vicomte de (1753-1840), Fr. philosopher and politician. He left France on the outbreak of the Revolution, and after serving in the army of the Prince de Condé, he settled at Heidelberg. In 1796 he pub. his *Théorie du pouvoir politique et religieux*, and in it prophesied the return of the Bourbons. After the Restoration he became a prominent political figure, and advocated the strongest conservative measures, attacking all reform. In 1822 he became a minister, and in the following year was raised to the peerage. After the revolution of 1830 he retired from politics, and on his refusal to take the necessary oath his peerage was taken from him.

Bonanza, originally a Sp. word meaning literally 'fair weather,' is used popularly of any lucky and successful enterprise, especially a lucky strike in a mine. The Australian slang word *bonzer*, meaning 'first-rate' is said to be derived from it.

Bonanza Creek, Yukon, Canada, a valley with rich gold deposits, opening into the Klondike near Dawson.

Bonaparte, family name made famous by Napoleon I (q.v.). In its original It. form it was Buonaparte, and in this form was retained by the whole family up to the year 1796. The family were descended from an ant. It. family who can be traced back to the 12th cent., and who settled in Corsica during the 16th cent. Charles B., the father of the famous emperor, was b. in 1746, and educ. at Pisa. In 1767 he married Letizia Ramolino, a

beautiful girl descended from an ancient Corsican family. Charles B. held several offices under the Crown of France in Corsica. He obtained for his second son, Napoleon, a place in the military school at Brienne during the period that he was resident in France as one of a deputation of Corsican nobles. In 1779 he returned to Corsica, and 6 years later *d.* at Montpellier, where he had gone for his health. His wife, Letizia, survived him by several years, and saw the rise and fall of the fortunes of the family. She spent most of her life after 1814 in Rome with her stepbrother, and *d.* in 1836, leaving a considerable fortune, which she saved during the days of Napoleon's power.

Joseph Bonaparte (1768-1844), eldest brother of Napoleon I, *b.* Corsica. He was educated in France, and later studied law at Pisa. He left Corsica when the Paolists were victorious. He spent some time in Paris, but shortly afterwards settled in Marseilles, where he married Julie Clary. In 1796 he took part with his brother in the Italian campaign, and in the following year was appointed minister at Rome. Later he became a member of the Council of the Five Hundred, representing Corsica. He retired from this position in 1799, but during the next few years took a leading part in diplomatic negotiations. He helped to negotiate a treaty with the U.S.A., and was one of the representatives of France at the negotiations which led to the treaty of Amiens in 1802. He helped also in the negotiations for the Concordat. In 1805, during the absence of Napoleon, he acted as the head of the gov. In the same year he went to Naples at the head of the Fr. army, and in the following year he was proclaimed King of Naples. In 1808 he was proclaimed King of Spain, but his title was purely nominal, and although he remained in Spain until 1813, he was continually being harassed both by the English and by Napoleon himself. On the surrender of Paris in 1814 he retired from public life, but helped his brother during the Hundred Days. After 1815 he settled in the U.S.A. In 1830 he attempted to get the claims of the Duke of Reichstadt (Napoleon II) recognized by the European powers, but failed. He afterwards resettled in Europe, dying in Florence.

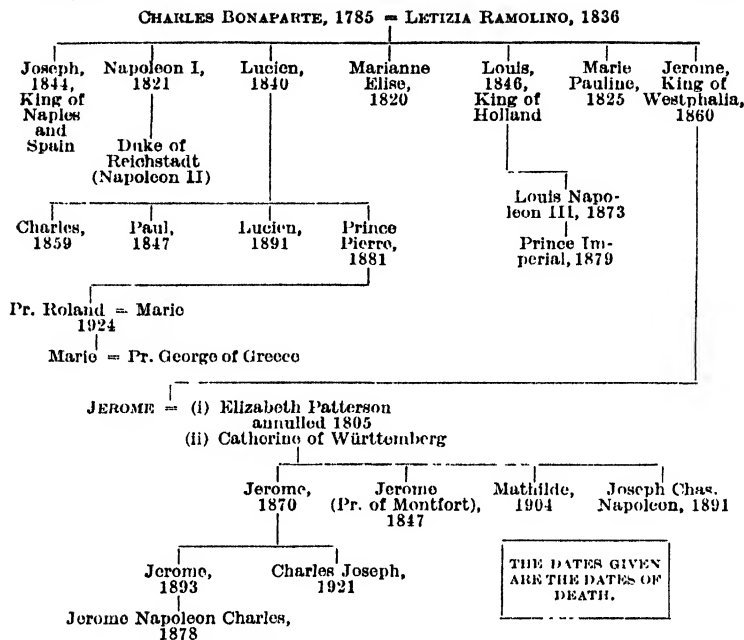
Lucien Bonaparte (1775-1840), Prince of Canino, younger brother of Napoleon I, *b.* Ajaccio, Corsica. He was originally intended for the Church, but in 1789 he became a Jacobin, and in 1794 he was for a short time imprisoned because of his extreme revolutionary ideas, but was released owing to the influence of Napoleon. In 1797 he refused a place offered him in the army of Egypt, preferring to enter the Council of the Five Hundred. In 1799 he was its president, and gave considerable help to Napoleon when Napoleon overthrew the councils on the 19th Brumaire. He was, however, essentially a democrat, and during the 5 years that intervened between the overthrow of the council and the assumption of the imperial crown by Napoleon, affairs were very strained between the brothers.

After 1804 he became one of Napoleon's ministers, but owing to personal differences with his brother was forced to retire and was given the position of minister at the Spanish court. Later he resigned his position in Madrid and returned to France. He gave further offence in 1803 by marrying the widow of a stockbroker and publicly bestowing on her the name of B. He was therefore ordered to leave France, and retired to Italy. In 1807 he was offered the kingdoms of Naples and Spain on condition that he renounced his wife. This he refused to do. He took the papal title of Prince of Canino. He attempted to reach America, but was captured by the English and brought back to England, where he remained until 1814. During the Hundred Days he supported his brother, and after 1815 lived in Italy, where he *d.* He left 4 sons and 6 daughters.

Louis Bonaparte (1778-1846), King of Holland, brother of Napoleon I, *b.* Ajaccio, Corsica. He acted as aide-de-camp for Napoleon during the Italian campaign, having received a military education at Brienne, and was also with Napoleon during the Egyptian campaign. He was married in 1802 to Napoleon's stepdaughter, Hortense Beauharnais, but the marriage was very unhappy. In 1806, Napoleon made him King of Holland. From the very outset his policy displeased Napoleon, and his attempts to govern liberally added to this displeasure. By 1809 Napoleon had resolved that his control of Holland should become real, and in 1810 Louis fled the country and went into exile in Bohemia. After 1815 Louis lived chiefly in Rome, where he took a great interest in literary and philosophic studies. His sons were: Napoleon Charles (*d.* 1807), Napoleon Louis (*d.* 1831), and Charles Louis Napoleon (Napoleon III, *d.* 1873).

Jerome Bonaparte (1784-1860), King of Westphalia, youngest brother of Napoleon, *b.* Ajaccio, Corsica; educ. at Julliy. He was a lieutenant in the Fr. Navy. In the U.S.A., although a minor, he married Elizabeth Patterson, the daughter of a Baltimore merchant, but Napoleon declared the marriage void (1805). He again took part in a naval expedition, and on his return in 1806 was made a prince of France. He took part in the German campaign of 1806, and by the treaty of Tilsit (1807) was made King of Westphalia. In Aug. 1806 he married Catherine, daughter of Frederick, King of Württemberg. After the downfall of Fr. power in Germany he retired to France, and afterwards to Switzerland. In 1815 he helped Napoleon at Waterloo, commanding a part of the Fr. left wing, and showing great courage. After 1815 he lived principally in Italy and Switzerland until 1851, when on the accession of his nephew, Louis Napoleon III, he came back to France and was made a marshal and President of the Senate.

Marianne Elise Bonaparte (1777-1820), eldest sister of Napoleon I, *b.* Ajaccio, Corsica. In 1797 she married Felice Bacciochi, a wealthy Corsican officer. She was extremely ambitious, and



Napoleon gave her the principality of Lucra. In 1808 she received the grand duchy of Tuscany, and was an important influence in It. politics. Her relations with Napoleon were frequently strained. After 1815 she lived in retirement at Bologna.

Marie Pauline Bonaparte (1780-1825), sister of Napoleon I, b. Ajaccio, Corsica. At the age of 17 she married Gen. Leclerc, who d. in 1802. In 1803 she married Prince Camillo Borghese, and went to live in Rome. She soon, however, returned to Paris, where her way of life caused great scandal. In 1806 she was made a duchess. After 1815 she lived chiefly in Italy. She was Napoleon's favourite sister.

Of the other descendants of the B. family among the more important are the 3 eldest sons of Lucien, Charles Lucien, Louis Lucien, and Pierre Napoleon. The first took practically no part in politics, but distinguished himself as an ornithologist. The second was a deputy under the Second Rep., but is better known as a philologist; whilst the third, who spent the greater part of his life in politics, shot a journalist in 1870, but was later acquitted of murder.

Other members of the B. family include the following:

Napoleon Joseph Charles Paul (1822-1891), the second son of Jerome, King of

Westphalia, by his second wife, Catherine, of Württemberg. Commonly known as Prince Napoleon and 'Plon-Plon.' He commanded a div. at the Crimean war. After the death of the Prince Imperial he became the head of the Imperialists.

Napoleon Eugène Louis (1856-79), the only son of Napoleon III, b. Paris. He was always delicate, but took part in the early part of the Franco-Prussian war, later coming with his mother, the Empress Eugénie, to England, where they settled at Chislehurst. He was recognized as Napoleon IV by the Imperialists on the death of his father. He volunteered for service with the English during the Zulu campaign, and was killed during it on 1 June 1879. He was buried at Chislehurst.

Charles Joseph Bonaparte (1851-1921), Amer. politician, younger son of Jerome Napoleon B. and grandson of Napoleon I's youngest brother, Jerome, by his first marriage with Elizabeth Patterson of Baltimore. He was educ. at Harvard and called to the Amer. Bar. He became secretary of the navy in Theodore Roosevelt's gov. of 1905, and, later, attorney-general.

Bonaparte, Napoleon, see NAPOLEON I. **Bonar, Horatius** (1808-89), Presbyterian minister, b. Edinburgh, educ. at the high school and the univ. of that city. He began his work as a minister at Leith.

At the disruption in 1843 he had become the minister of the Free Church of Kelso, and from here he passed on to the Chalmers Memorial Church in Edinburgh. He was made D.D. in 1853 by the univ. of Aberdeen, and in 1883 he was moderator of the General Assembly. He ed. the *Presbyterian Review* and other papers. Among the more noted of the hymns written by him may be mentioned 'Go labour on,' 'I heard the voice of Jesus say,' and 'When the weary seeking rest.'

Bonasa, genus of grouse which belongs to the family Tetraonidae. *B. umbellus* is the ruffed grouse of N. America, which is characterized by the absence of feathers on the toes and lower part of the legs, the long rounded tail, crested head, and the ruff on its neck. *B. sylvestris* is the hazel grouse.

Bonasone, Giulio (c. 1498-post 1572), It. painter and engraver, b. Bologna; studied under Sabbatini. His reproductive work which was done almost entirely with the graver, includes prints after Michelangelo, Raphael, and Titian (qq.v.), and his style of engraving influenced Wm Blake.

Bonasmus, name of the European species of bison (q.v.).

Bonaventura, Saint (1221-74), Franciscan theologian, b. Bagnorea in Tuscany. His real name was John of Fidanza. He was destined for the Church from his youth, and in 1243 he entered the Franciscan order. He studied at Paris, where in 1253 he became a teacher, succeeding his own master, John of Rochelle. In 1255 (or 1257) he became a doctor, and shortly after he was selected general of his order. On the death of Clement IV it was his influence which patched up the quarrel of the cardinals and led to the election of Gregory X, who rewarded him with the red hat of a cardinal and the bishopric of Albano. The same pope insisted upon his attendance at the Council of Lyons, where he d. a martyr to his own asceticism. He was popularly regarded as a saint before his death, but was formally canonized by Sixtus IV in 1482, and ranked as sixth amongst the doctors of the Church by Sixtus V in 1587. Danto places him amongst the saints in his *Paradiso*. His works were devoted to the defence and praise of his order, but his doctrines are in marked contrast to those of Thomas Aquinas and Roger Bacon. The purely intellectual was never to him in as high a plane as the power of the affections and the heart. He condemns the Aristotelian doctrine of the eternity of the world. The warmth of his style and his religious fervour gained for him the title of Doctor Seraphicus. Amongst his chief works may be mentioned *Itinerarium Mentis ad Deum*, *Breviloquium*, *De Reductione Artium ad Theologiam*, and *De Septem Itineribus Aeternitatis*. Amongst the eds. of his works are Rome, 1588-96, Lyons, 1668, Venice, 1751, and Rome, 1882-1902.

Bonavista, name of a tn. a bay, and a cape in Newfoundland. The tn is one of the oldest on the is., and is also a port. Its pop. is 3718. The cape is on the E.

coast, and has an altitude of 150 ft, upon which is a lighthouse with a revolving light. The bay is 30 m. wide.

Bonchurch, vil. in the Isle of Wight, England, about 1 m. from Ventnor. It is near S. Boniface's Down, and has an old and a new church, the latter containing the tomb of A. C. Swinburne. In the vicinity is Pulpit Rock. Pop. 500.

Boncourt, Louis Charles Adelaide de Chamisso de, see CHAMISSO, ADALBERT VON.

Bond, Sir Edward Augustus (1815-98), prin. librarian at the Brit. Museum from 1878, and an accomplished palaeographer, founded the Palaeographical Society in 1873. To him are due a number of the reforms and improved efficiency of sev. depts in the Brit. Museum. He ed. 4 vols. of facsimiles of A.-S. charters, and also ed. *The Speeches in the Trial of Warren Hastings*. He was knighted on 1 Jan. 1898, and d. on the following day.

Bond, Sir Robert (1857-1927). Brit. statesman, b. St John's, Newfoundland, to which place his father, John B., had moved from Torquay. He was educ. at Queen's College, Taunton, and at Edinburgh Univ., where he took honours in law. He then returned to Newfoundland, where he entered the legislature in 1882, and 2 years later was elected Speaker of the House of Assembly. In 1889 he became colonial secretary in a Liberal gov. In 1890 he assisted Lord Poncefote in his negotiations with the U.S.A. for a reciprocity treaty, and was largely responsible for the completion of the Bond-Blaine Convention. In 1900 he was appointed premier, and in 1902 completed the Hay-Bond Treaty with the U.S.A. Unfortunately it did not pass the Senate. In 1907 he attended the Imperial Conference and received the freedom of London, Bristol, and Manchester. In 1909 his gov. was defeated. Resigned leadership and seat in 1914.

Bond, William Cranch (1789-1850), Amer. astronomer, b. Portland, Maine. He erected a private observatory, and was one of the exploring party who went to the S. Seas with an Amer. expedition in 1838. On his return he was made the director of the observatory at Harvard Univ., and whilst holding that position he discovered an eighth satellite of Saturn, named Hyperion.

Bond, paper quality, see PAPER.

Bond, in law, a deed, i.e. a document under seal, by which one party, the 'obligor,' binds himself to perform or refrain from performing some act, under a penalty if he fail, to be paid to the other party, the 'obligee'; the B. to be void on the performance of the act or the payment of the penalty. If the B. is for the payment of money, the condition in the B. usually is that the B. shall become void if the obligor pays to the obligee a smaller sum, generally one-half of the sum named in the B. together with interest. A B. runs for 20 years, and action on the B. is barred after that period. If the B. is for the refraining from doing a specific act, the payment of the penalty alone will

not be sufficient; the obligor must not continue in the act, e.g. of service with another firm. The B.s of a limited company are debentures, to be repaid, at a fixed period, or from a sinking fund. Other B.s are 'bottomry B.s' for sums advanced for the continuance of a voyage, secured on the ship, to be repaid on safe arrival. B.s given by holders of confidential posts are generally known as guarantees.

Bond Street, fashionable London shopping centre, running between Piccadilly and Oxford Street. The S. section, known as Old B. S., was built c. 1686 by Sir Thomas Bond, a member of Queen Henrietta Maria's household, after whom the street was named. The N. section, New B. S., was built c. 1721.

Bonde, or **Bonder** (Old Norse *buandi*, inhab.), term meaning a member of the peasant class in Scandinavian countries. This class used to form one of the orders composing the diet, but this has not been the case since the Finnish constitutional reform of 1906, when the diet of 4 estates was succeeded by the present one-chamber Parliament.

Bonded-fibre Fabrics. The manuf. of a non-woven cloth by the bonding of cotton and other textile fibres, was introduced into the U.S.A. in 1947 and has been developed in many countries as a general utility fabric. Produced under pressure and heating, it is a porous cloth made from various types of thermoplastic fibres. See CLOTH MANUFACTURING AND FINISHING.

Bonded Warehouse, store approved by the revenue or custom authorities in which imported goods subject to duty are stored until the bondor withdraws them for exportation or pays the duty. Before the estab. of these places in England, the payment of the duties had to be settled immediately on importation. This system had many drawbacks; one of the chief was that the prices of goods were raised in order that the large duties could be paid. In 1733 the first move was made towards the B. W. scheme by Sir Robert Walpole, but in 1803 the system was finally adopted.

Bondeno, It. tn, in Emilia-Romagna (q.v.), on the Po di Volano, 11 m. WNW. of Ferrara (q.v.). Pop. 19,000.

Bonder, see **BONDE**.

Bondfield, **Margaret Grace** (1873-1953), Labour politician, b. near Chard, Somerset; daughter of Wm B., worker at a lace factory in Chard. In 1898 she became assistant secretary of the National Union of Shop Assistants. She succeeded Mary Macarthur on her death in 1921 as secretary of the National Federation of Women Workers; was chairman of the Trades Union Congress, 1923; and in Nov. 1923 was elected M.P. for Northampton. In the Labour Gov. of 1924 she was parl. secretary to the Ministry of Labour; she attended the conference of the International Labour Conference at Geneva, where her activity was prominent. She lost Northampton at the general election of 1924; but re-entered Parliament in July 1926 as member for Wallsend, which she

represented until 1931. In the Labour Gov. of 1929-31 she was Minister of Labour, thus becoming the first woman to hold Cabinet rank. While in office she was confronted with the serious problem of unemployment, and in 1929 she sponsored the Unemployment Insurance Bill—an important measure in social legislation. See life by M. A. Hamilton, 1924.

Bondome, **Ambrogio di**, see **GIOTTO**.

Bondu, dist. in Senegal, Fr. Equatorial Africa. It is situated between the R. Faleme and the upper course of the Gambia. Much of B. is plateau land and is unproductive. The lower part is more fertile and fruit grows well. The Fula are the prin. inhab., and their religion is Muslim. Trade is in the hands of Mandingoes (q.v.). B. was visited by Mungo Park in 1795. Pop. 1,500,000 (estimated).

Bondy, Fr. tn, a suburb of Paris, in the dept of Seine, on the Ourcq canal. It has chemical and glass manufs. The notoriety of the former forest of B. as a haunt of cut-throats gave rise to a Fr. colloquialism. Pop. 19,500.

Bone, **Sir David William** (1874-), novelist, b. Glasgow, son of a journalist and brother of Sir Muirhead B. (q.v.). He went to sea at 15 as an apprentice on the square-rigged *City of Florence*, and served 7 years in sail. Joining the Anchor Line in 1899, he rose to be commodore of their fleet. His books, which are all about the sea, include *The Brassboulder*, 1910, *Broken Stowage*, 1915, *The Lookoutman*, 1923, and *Capstan Bars*, 1931. *Merchantmen at Arms*, 1919, which was illustrated by his brother, told of the work of the merchant service in the First World War. *Landfall at Sunset*, 1955, is an autobiography.

Bone, **Henry** (1755-1834), Eng. enamel painter, b. in Cornwall; apprenticed at Plymouth, and afterwards worked at the Bristol china works. He was elected a member of the Royal Academy in 1811. His copies in enamel after Old Masters are much sought after by connoisseurs; best known is his 'Bacchus and Ariadne,' after Titian.

Bone, **Sir Muirhead** (1876-1953), etcher and painter, studied at the school of art in Glasgow, and came to London in 1901, where he estab. his reputation by his remarkable etchings of buildings, docks, etc. 'For technical skill Bone can be compared with the great Italians, Piranesi and Bibiena' (Sir Kenneth Clark). In 1906 his 'Great Gantry, Charing Cross Station' was purchased by the National Art Collections Fund and given to the Brit. Museum. From 1916 to 1918, he was official artist on the W. front, and with the fleet. He was a trustee of the National Gallery and the Imperial War Museum. He was knighted in 1937, and in 1940 was appointed official war artist to the Admiralty. His illustrations to the *London Perambulator*, by his brother James, are fine examples of his draughtsmanship. He also illustrated *Old Spain*, with description by Gertrude B., 1936, and *Came to Oxford*, 1952.

Bône, *see* BONA.

Bone, the hard tissue that constitutes the skeleton or framework of the body. This framework serves to support some structures as a central core, and to protect others as a surrounding casing. The different parts of the framework are articulated or jointed with one another and are converted into levers by which a great number of movements can take place through the instrumentality of muscles (*see* JOINTS). B.s are of various shapes, according to the functions they fulfil. Long B.s, of cylindrical form, are characteristic of the limbs; flat B.s, with a certain amount of curvature, are characteristic of protective B.s; short B.s are characteristic of the wrist and instep; while such B.s as the vertebrae and those of the face are somewhat more irregular in form. In the developing foetus the B.s first appear as cartilage, which gradually becomes ossified as growth proceeds, a process which is not completed until the age of about 21. At birth all the larger bones have areas of ossification in the middle, and the long bones have small is. of ossification at each end. The former is known as the diaphysis and the latter as the epiphysis. Between the two is an area of cartilage known as the epiphyseal line. Since growth takes place at the epiphysis, the epiphyseal line is present until growth is complete. The age at which growth finishes varies with the different B.s, and from an examination of the state of the epiphyses it is possible to estimate the age of a child or adolescent. There are 206 distinct B.s in the ordinary adult. The functions and dispositions of the B.s are dealt with in the articles on SKELETON; SKULL; ARM; etc. Human B. consists of about 31 per cent of organic matter and about 69 per cent of mineral salts, of which calcium phosphate forms the greater part, being 58 per cent of the whole B. matter. The animal matter may be removed by boiling or charring. When the mineral matter only is left, the B. appears hard and brittle. The mineral salts may be dissolved out by treating the B. with acid, when a jelly-like substance remains, preserving the shape of the B., but possessing none of its characteristic hardness. Thus the combination of animal and mineral substances serves to produce a substance which is at once hard, tough, and elastic. The qualities of B. as a useful substance in itself have been recognized in the arts. It is stronger than oak, can withstand a tremendous crushing strain, and yet is so elastic that savages have used the ribs of large animals for making bows. An examination of a fresh B. shows it to be covered with a strongly adhering membrane, which is called the *periosteum*. Underneath this the B. appears as a hard compact mass, gradually decreasing in hardness towards the axis, so that the inner part of the B. is of a spongy nature, while in certain situations there is a cavity, often filled with marrow, in the interior. In curved B.s there is a thickening of the hard compact portion on the concave side, where the greatest strain occurs. The B. is

thus most economically constructed, the greatest strength and elasticity being combined with lightness of material. All B.s are provided with channels by which the nourishing elements in the blood may penetrate to the interior, while the vessels of the periosteum enter the surface by many fine arteries. For diseases of the B. *see* OSTEITIS; OSTEOMYELITIS; TUBERCULOSIS (CARIES). For fractures *see* FRACTURES. *See* H. Gray, *Anatomy* (31st ed.), 1954.

Bone-ash, white residue remaining when bones are heated with access of air till all organic matter is oxidized. Bones are usually boiled to remove the fat and glue-forming substances and the remainder is burnt. The ash consists of tricalcium phosphate, and is used as a manure, in the manuf. of superphosphates, and in the manuf. of porcelain.

Bone Beds, strata or deposits of bones found on land or beneath the sea. They are thin layers of the remains of bones of reptiles, fishes, and mammals, occurring in certain places. At Ludlow, for example, there is a B. bed stretching for many miles. There are some also in the SW. of England, and similar ones in Germany. The Rhaetic B. B.—so called from deposits found at first near the Rhaetian Alps—form part of the Triassic System. There is a B. bed under the sea near the Faroe Is., and this contains shells mixed with the bones.

Bone-black, animal charcoal, obtained by the dry distillation of bones. When the fat and gelatines are removed from the bones the remainder is heated in closed retorts. The product is about one-tenth charcoal, the remainder being calcium and magnesium phosphates and other mineral salts. It is used for removing colouring matter and the refining of many commercial products, e.g. raw sugar, and the removal of fuel oil from whisky before the latter is rectified.

Bone Manure, general name for fertilizing agents in which powdered bones, or substances derived from bones, are present. The most important mineral element which has to be supplied to cultivated soil is phosphorus. The value of bone as a phosphorus-supplying manure was realised by Liebig (q.v.) in 1840, and at the experimental farm of Sir John Lawes at Rothamsted in 1843 the possibilities of artificial phosphates were investigated. The bones were dissolved in sulphuric acid to obtain the calcium superphosphate, which was soon found to be of the highest value as a manure.

Bone Oil, a fetid, blackish-brown, thick liquid obtained by dry distillation of bones, or by heating them with water and by use of solvents. Extracted also in preparation of bone-black, and used in soap-making. Contains ammonia, sulphuretted hydrogen, pyrrrol, etc. Dippel's oil, an animal oil produced by distillation of stags' horns, is used as medicine.

Boner, Ulrich (c. 1324-49), Swiss writer of fables, b. Bern, and descended from a famous Bernese family. He probably took clerical orders and became a friar. His name is of frequent occurrence

between the dates 1324 and 1349. His book of 100 fables, *Der Edelstein*, was one of the first Ger. books to be printed, in 1461.

Boneshaker, see CYCLES AND CYCLING.

Bo'ness, formerly **Borrowstounness**, burgh and seaport of W. Lothian, Scotland, situated on the Firth of Forth, 21 m. W. of Edinburgh. It has a harbour and dock with considerable continental trade, a shipbreaking yard, pottery manufs., coal-mines, and timber yards (pit-props). Kinneil Estate is now a public park, and Kinneil House has been taken over as an ancient monument. The Antonine Wall, also known as Graham's Dyke, traverses the par. There is an 18-hole golf-course. Pop. 10,000.

Bonet, Juan Pablo (c. 1590-1630). Sp. philanthropist, who in 1620 pub. at Madrid a work on the instruction of deaf-mutes. His method, which was probably largely that of Pedro Ponce de León (c. 1520-84), corresponds to what is now known as the 'combined system,' i.e. he used phonetics as well as the manual alphabet. He taught the meaning of nouns by pointing, verbs by action, and the other parts of speech by continual use. Eng. trans. of his book, 1890.

Bonet, or Bonnet, Théophile (1620-89), Swiss physician, b. Geneva; took his degree in medicine in 1643, and practised in Geneva with great success till about 10 years before his death, when, having become deaf, he relinquished practical work for writing. He is best known as having been a pioneer in the science of pathological anatomy, but he also wrote numerous treatises on different branches of medicine and surgery. His chief works were *Labyrinthus Medicus Extricatus* and *Seputchretum Anatomicum seu Anatomia Practica*, 1679. Of this last, a corrected ed. by Manget was issued in 1700. See Nicéron's *Mémoires*.

Bonfadio, Jacopo (d. 1550), It. philosopher and historian, b. Gorzano, near Salò; educ. at Verona and Padua; in 1535 he became a private secretary to Cardinal Ghinucci at Rome. In 1545 B. became prof. of philosophy at Genoa, of which city he wrote a hist., *Annales Genovenses*, 1528-50. His other works include letters, poems, and a trans. of Cicero's *Oratio pro Milone*.

Bonfidius, Edmund (1536-74), Fr. jurist.

Bonfire (Early Eng. *bonefire*; Scottish *banefire*), in its original meaning a fire for burning bones, term now used to designate any fire which is lit in the open air, usually on an occasion of national rejoicing. The origin of the lighting of these fires seems undoubtedly to be pagan, since the early Church did its best to stop the custom of lighting fires, which were described as of heathen origin. Nevertheless, sev. Christian festivals came to be celebrated by the lighting of B.s. In many countries St John's Eve and St Peter's Day are celebrated in this way. The great 'B. day' in England is 5 Nov., Guy Fawkes' Day.

Bongar (*Bungarus*), genus of poisonous snakes in the family Colubridae. *B. candius*, the krait, is common to India, and

though only about 4 ft in length it is a very deadly reptile.

Bongardia, genus of one species, *B. chrysogonum* (family Berberidaceae), a tuberous-rooted perennial of Syria and Persia, with golden yellow flowers and edible leaves.

Bonghi, Ruggiero (1828-95), It. scholar and statesman, b. Naples. He had to leave there after 1848 and go to Tuscany, and was later exiled to Turin for an article against the Bourbons. At Turin he resumed his philosophic studies and his trans. of Plato. In 1860 he returned to Naples, and threw in his lot with the Cavour party, and some years later became minister for public instruction. He reformed the It. educational system and founded the Vittorio Emanuele library in Rome. Among his works are a trans. of the Dialogues of Plato, 1880, and *Storia di Roma*, 1884.

Bonham, co. seat of Fannin co., Texas, U.S.A. It is situated on Bois d'Arc Creek, and has a pop. of 7000.

Bonheur, Rosalie Marie, usually called **Rosa** (1822-99), Fr. artist, b. at Bordeaux. She was descended from a family of Swedish origin and also a family of considerable artistic talent. She exhibited with success at the Salon her study of living animals, her faithful representation of them giving her international popularity. She received the decoration of the Legion of Honour and afterwards became an officer of the same order. Among her more famous pictures may be mentioned 'Ploughing in the Nivernais,' 1848, and 'The Horse Fair,' 1853, in the U.S.A. (a replica is in the National Gallery). 'The Horse Fair' toured England and made a great sensation.

Bonhill, par. of Dunbartonshire, Scotland, 3 m. N. of Dumbarton, comprising 3 vils: Alexandria, Balloch, and Jamestown. Strathleven industrial estate is in the par. Pop. (par.) 16,730.

Boniface, name of 8 Popes, and of 1 antipope (*Boniface VII*, 974). See POPES, LIST OF THE.

Boniface I, St (418-22), successor of St Zosimus. He was opposed by the antipope Eulalius, but was recognised by the imperial gov.

Boniface II (530-2), by birth a Goth, was nominated by his predecessor, St Felix IV, through the influence of the Ostrogothic king. He attempted to use this method of appointment as a precedent, but failed in the nomination of his own successor.

Boniface IV, St (608-15), succeeded **Boniface III**. He converted the Pantheon at Rome into a Christian church.

Boniface V (619-25), successor of St Deusdedit. According to Bede he did much for the conversion of England; he is said to have fixed upon Canterbury as the metropolitan see, although St Augustine had intended that honour for London after his own death.

Boniface VIII (Benedetto Gaetano) (1294-1303), succeeded to the papal chair on the abdication of Celestine V. B.'s insistence on his rights in the temporal sphere coincided with the triumph of

nationalism, and made him numerous enemies. The most bitter and most powerful of these was Philip IV of France. The bull *Clericis laicos* (1296), forbidding taxation of the clergy without papal consent, called forth Fr. reprisals, which obliged B. to modify his tone. But in the jubilee year of 1300 he once more paraded the temporal authority, and 2 years later re-opened the breach with Philip by the celebrated bull *Unam sanctam*. The Fr. vice-chancellor, Guillaume de Nogaret, accompanied by Sciarra Colonna, was sent to Anagni to arrest the Pope and bring him before a general council for deposition on a variety of charges, including heresy. B. was insulted by these envoys in a scene known to hist. as the Outrage of Anagni (7 Sept. 1303). He escaped to Rome, but *d.* of grief and humiliation the same year at the age of 83.

Boniface IX (1389-1404), succeeded Urban VI, by whom he had been elevated to the purple. He won back the greater part of the papal states, and his private life was irreproachable. His pontificate, however, was marred by nepotism and the sale of offices.

Boniface, Saint (680-755), known as the apostle of Germany, *b.* Crediton in Devonshire, his baptismal name being Winfrid. A Benedictine, and head of the abbey school at Nutschulling, he was ordained priest in 710. After an unsuccessful attempt to evangelise Germany in 716, B. went to Rome in 718 and obtained the Pope's blessing on his work. Thenceforward he preached with astonishing results in Bavaria, Hesse, Friesland, Thuringia, and Franconia. His promotion was as follows: bishop, 723; metropolitan beyond the Rhine, 731; papal legate, 738; Archbishop of Mainz, 744. B. founded a great number of schools and religious houses, including the Abbey of Fulda where his relics lie. Martyred at Dokkum, his feast is on 5 June.

Boniface of Savoy (*d.* 1270), Archbishop of Canterbury, son of Thomas of Savoy and uncle to Henry III's wife, Eleanor. B. was a Carthusian. His election to the see of Canterbury in 1241 proved so unpopular that he withdrew to Rome in disgust, 1250-2; in 1256 he took part with the bishops against the king, but in 1263 joined the papal legate in excommunicating the rebellious barons. He *d.* while accompanying Edward I on a crusade.

Bonifácio, José, 19th-cent. Brazilian patriarch of independence and liberator of the slaves.

Bonifacio: 1. Strait separating Corsica and Sardinia (q.v.). It is only 7 m. wide, but navigation is made difficult by the numerous small is.

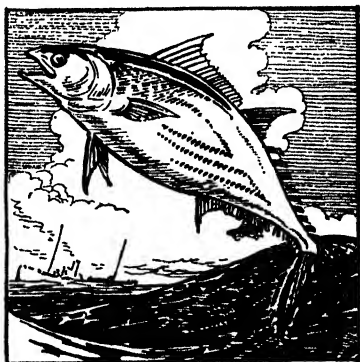
2. In Corsica, on the strait of B., 43 m. SE. of Ajaccio (q.v.). It is built on a high promontory, but has a port in the fiord 200 ft. below. There is a citadel and there is a beautiful 12th-13th-cent. church. Pop. 3600.

Bonin Islands, or **Ogasawara Jima**, group of is., N. Pacific Ocean, lat. 26° N., long. 143° E., 700 m. SSE. from Japan. They number about 20, but only 10 are

of any considerable size. They have been divided into 3 groups; the N. group are called the Parry Is., and those in the centre the Beechey Is., while the S. group are the Bailey or Coffin Is. The whole of them are of volcanic origin. They were discovered in 1639 by Quast and Tasman. In 1827 Capt. Beechey visited them, and took possession of them for Britain, and in 1878 the Japanese re-claimed them. Port Lloyd is the chief port. Pop. 1500.

Boning, see **BORNING**.

Bonington, Richard Parkes (1802-28), artist, *b.* at Arnold, near Nottingham. The family went to France c. 1817, B. studying art under Louis Francia at Calais and under Baron Gros in Paris. In 1822 he began to exhibit at the Salon, and in 1824 was awarded a medal there. His pictures are distinguished by the purity and brilliancy of their colouring. His fame has grown with time. While much of the best in Fr. landscape painting may be said to date from Constable, a great deal has to be allowed to the influence of B. Delacroix was one of his friends and admirers. His 'Henry IV receiving the Spanish Ambassador' was bought by Lord Hertford for over 80,000 francs, and his 'Grand Canal, Venice' and 'Fish-market, Boulogne' also realised high prices. He exhibited sev. pictures at the Royal Academy. In the National Gallery are his 'Piazzetta, St Mark's, Venice' and 'Sunset.' His water-colours are well represented in the Wallace Collection, and he executed brilliant lithographs. He worked mainly in France, and, never strong, *d.* when on a visit to England to seek medical advice. See monograph by Dubuisson (trans. 1924).



BONITO

Bonito (*Katsuwonus pelamis*), fish of the family Scombridae. It belongs to the same family as the tunny (q.v.), and is allied to the mackerel.

Bonivard, François (c. 1493-1570), the hero of Byron's poem, 'The Prisoner of

Chillon.' He was b. Seyssel, being descended from an old noble family of Savoy. He succeeded his uncle as prior of the Cluniac priory of St Victor in 1510. Resisting the encroachments of the Duke of Savoy, he was arrested and imprisoned. His first imprisonment only lasted for about 2 years, at the end of which time he was released. But he still remained a great antagonist of the duke, and in 1530 he was again arrested and imprisoned. He spent some 4 years underground, in the castle of Chillon, and was only released in 1536 on the seizure of the castle by the Bernese, who had revolted and won back Vaud from the duke. The details of his imprisonment as we have them from Byron owe a considerable amount to the imagination of the poet. He became a Protestant shortly after his release, and received a pension from Geneva. He was appointed in 1542 to write an official hist. of Geneva, and his *Chroniques de Genève* were written between this time and his death, but they were not pub. until 1831.

Bonjem, small tn of Tripoli, N. Africa, situated 150 m. to the N. of Sokna. It is situated in an oasis, and has Rom. antiquities and ruins.

Bonn (anc. *Castra Bonnensia*), Ger. city in the Land of N.-Rhine-Westphalia (q.v.), on the Rhine (q.v.), 37 m. SSE. of Düsseldorf (q.v.). In 1949 it was made the cap. of the W. Ger. Federal Rep. By origin a Celtic settlement, B. became an important Rom. camp on the Rhine, and it regained its importance in the Middle Ages when it became the residence of the electors and archbishops of Cologne. The tn was sacked by the Elector Frederick III of Brandenburg in 1689, was under siege in the War of the Sp. Succession (see SPAIN, *History*), and was occupied by the French during the Napoleonic wars. In 1815 it passed into the possession of Prussia. After the First World War it was occupied (1918-26) first by Brit. and then by Fr. troops. The beautiful minster of B. (severely damaged during the Second World War) belongs to the 11th and 12th cents. The former palace of the electors is now occupied by the univ. (founded 1786; refounded 1818), which is one of the most important in Germany. On the S. side of the city a new administrative dist. has grown up since the end of the Second World War; it contains various gov. buildings, including the *Bundeshaus* (Parliament House), a structure in modern style. B. was the bp. of Beethoven (q.v.), and his house is still preserved as a museum. There are engineering, tobacco, printing, and flag-making industries. Pop. 139,200.

Bonnard, Pierre (1867-1947), Fr. painter, b. Fontenay-aux-Roses, near Paris. He began life as a civil servant, but soon abandoned an official career for art. He learned under Bouguereau, but the chief influences on his own style were Renoir and Toulouse-Lautrec in colour and drawing respectively. For a brief period he was associated with the followers of Gauguin, styled the 'Nabis,' but he is better described as a late and notable disciple of Impressionism. His most

characteristic paintings were of interiors with figures draped or nude, but he also painted a number of landscapes and still-life subjects. In 1940 he was made an honorary member of the Royal Academy. In 1941 six works by B. were sold for one million francs. See monographs by F. Fosca, 1919, and J. Renald, 1948; also T. Natanson, *Le Bonnard que je propose*, 1953.

Bonnat, Léon Joseph Florentin (1833-1922), Fr. portrait-painter, b. Bayonne; studied in Madrid and Paris. His reputation was estab. by his 'St Vincent de Paul taking the place of a Galley Slave' (1866) and other religious works showing the influence of Sp. masters. His fame rests chiefly on his portraits of celebrities, including those of Victor Hugo, Dumas, Gounod, and Thiers. See Van Dyke's *Modern French Masters*, 1896.

Bonner, Edmund (c. 1500-69), bishop of humble origin; educ. at Pembroke College, Oxford. He was chaplain to Cardinal Wolsey, 1529, and in 1532 was sent to Rome by Henry VIII to press the claims of Henry's divorce from Catherine of Aragon. He was made Bishop of Hereford in 1538, and Bishop of London in 1539. B. was in favour of the principle of royal supremacy during Henry's reign, but refused to enforce the use of the new Prayer book under Edward VI, and as a result was confined in the Marshalsea prison from 1549 to 1553. He was restored to his see on the accession of Mary, and was conspicuous by his zeal in the persecution of the London Protestants during this reign. He refused to take the oath of supremacy on the accession of Elizabeth, and was sent to the Marshalsea prison again where he d. That B. was more harshly treated than the other deprived bishops is probably explained by Elizabeth's personal dislike of him, and by his notoriety as a persecutor of Protestants.

Bonne's Projection, in map projection, a method first employed in a rough form by Ptolemy for the second projection of his World Map, and by Bonne in 1752. It was also adopted by the Fr. war depot in 1803 for the map of France on the scale of 1/80,000, and much used in the last cent. for continental services. In Great Britain it was used for the old ordnance survey of Scotland and Ireland on the scale of 1 in. to the m., and is also frequently used in atlases. It is a modification of the simple conic, in which all the parallels are divided truly and the meridians are curves passed through these dividing points. The projection is equal area and the scale is along and perpendicular to the parallels. It is not well adapted for countries with great extent in long., because the intersections of the meridians and parallels become very oblique—as may be seen at a glance at the map of Asia in most school or other atlases. See MAPS.

Bonnet, Charles (1720-93), Swiss naturalist and philosopher, b. Geneva. His observations and experiments on aphids or tree lice gained for him in 1740 the rank of corresponding member of the Fr. Academy of Science, and 3 years later he became a fellow of the Royal Society.

In 1745 appeared his first pub. work, which was called *Traité d'insectologie*, and in 1754 his researches in botany and the results he had obtained from his long work in this subject were pub. in *Recherches sur l'usage des feuilles dans les plantes*. He next turned his attention to philosophy, his eyesight preventing him from further continuing his natural science experiments. His *Contemplation de la nature* was pub. in the years 1764-5. His last work of importance was *Palingénésie philosophique* (1769-70) in which he develops the idea he had already put forward that animal life is continued and perfected in a future existence.

Bonnet, Théophile, see BONET.

Bonnet (Lat. *bonelum*, stuff, thence cap made from stuff), soft cap or covering for the head. It was worn, and so called, in England until the latter years of the 17th cent., and in Scotland till later. The genuine B. of the Scotch peasants was made of a thick woollen fabric, with no lining; it was of a round, flat shape, generally dark blue in colour, with a red tuft on the summit. It was extremely durable. The glengarry B., which is still worn by Scottish soldiers, rises to a point in front, and has ribbons at the back. Stewarton and Kilmarnock, in Ayrshire, have been noted for the making of Scottish B.s since very early times. From the fact that small landed proprietors in Scotland continued to wear B.s for some time after their use had been discontinued elsewhere, they were known as B. lairds. The use of the word B. as applied to men's head-gear has now fallen into disuse, and the term is applied only to ladies' wear. A B. differs from a hat in fitting closely to the head, and often having no brim. It varies considerably, however, in both shape and decorations, according to the prevailing fashion. The B. of a ship's sail is an additional piece which is now laced on to the bottom of the sail, but was formerly at the top. The term is also used for various protective devices, and a slang name for a gambler's accomplice is a 'bonnet.'

Bonnet Piece, gold coin of the time of James V of Scotland. On it was a figure of the king, who was the first king of Scotland to have dates put on coins, wearing a bonnet on his head instead of a crown—this being the origin of the name of the coin.

Bonnétâble, tn in the dept of Sarthe France, on the R. Triptotin. 14 m. from Mamers. It has a beautiful 15th-cent. castle. There are boot and other leather manufs. Pop. 3500.

Bonneval, Claude Alexandre, Comte de (1675-1747), Fr. soldier of fortune. At the age of 13 he joined the army. While serving in the Netherlands under Luxembourg, he was condemned to death by court-martial, and fled to Germany. Entering the Austrian service, he distinguished himself by his conspicuous gallantry. With the Austrian army he fought against France, and also against Turkey. His ungovernable temper, however, led to a quarrel with Prince Eugène, his patron. He was again sentenced to

death by court-martial, but the sentence was commuted, and he was exiled. He offered his services to the Turkish sultan, by whom they were accepted, and he changed his faith, becoming a Muslim and taking the title of Ahmed Pasha. He helped to reorganize the sultan's army. He rendered great services to Turkey during the Russian and Persian wars, and was made governor of Chios. Later he fell under the suspicion of the sultan, and was banished to the shores of the Black Sea, where he d.

Bonneval, Fr. mrkt tn in the dept of Eure-et-Loir, at the confluence of the Loir and the Ozanne. It has the remains of an abbey founded in 841. Pop. 3800.

Bonneville, Nicolas de (1760-1828), Fr. man of letters, was president of a dist. of Paris from the first days of the revolution. With Fauchet he brought out the *Cercle Social*, the *Chronique du Jour*, etc. Under the Terror, 1793, he was imprisoned, and later persecuted under Napoleon. He was among the first Frenchmen to study Ger. literature. His *Nouveau Théâtre allemand* was pub. 1782-5, and *Histoire de l'Europe moderne*, 1789-92. He pub. a volume of *Poésies* in 1793.

Bonneville, Fr. tn, cap. of an arron., in the dept of Haute-Savoie. Wine is produced. Pop. 2500.

Bonneville, Lake, extinct lake of the U.S.A. which in a recent geological period extended over a quarter of the total area of the Great Basin, a vast region of inland drainage in the S.W., extending over Nevada, Utah, Oregon, and California. For further details see GREAT BASIN.

Bonney, Thomas George (1833-1923), geologist, b. Rugley; educ. at Uppingham and at St. John's College, Cambridge. In 1877 he was made prof. of geology at Univ. College, London. He was president of the Geological Society, 1884-6, and secretary of the Brit. Association, 1881-5. His works include *The Alpine Regions*, 1868, *The Story of Our Planet*, 1893, *Volcanoes*, 1898, *The Present Relations of Science and Religion*, 1913, and *Memories of a Long Life*, 1922.

Bonnier, Gaston (1853-1922), Fr. botanist, b. Paris, prof. of botany at Paris Univ. He proved experimentally the synthesis of lichens. His *La Flore de la France et de la Belgique* is the leading work of its kind in both those countries. (Eng. trans. and adaptation by Ethel Mellor, 1925.)

Bonny, tn in S. Nigeria, W. Africa. It is situated on a creek on the E. side of the R. B., near the mouth. It is swampy, and a most unhealthy tn. It has a large trade in palm oil. The R. B. is one of the delta mouths of the Quorra. Its anchorage is good and safe. Pop. 6500.

Bonnyrigg and Lasswade, joint burgh of Midlothian, Scotland, some 2 m. S.W. of Dalkeith, on the N. Esk riv. The poet Wm Drummond of Hawthornden is buried in Lasswade church; his mansion of Hawthornden lies 2 m. S.W. Sir Walter Scott lived in Lasswade from 1788 to 1804. Ironstone is quarried locally. Pop. 5860.

Bonomi, Ivano (1873-1951), It. politician, b. Mantua, member of the Reform party. He held sev. cabinet posts between 1916 and 1922, in 1920 signing with Storza the treaty of Rapallo which, *inter alia*, gave Fiume its independence. When Mussolini came to power he retired from politics, but returned in 1944 to succeed Badoglio (q.v.) as Prime Minister of a coalition gov. He resigned in 1945.

Bononcini, Giovanni (1672-1747), b. Modena, son of Giovanni Maria B. He became famous as a composer of operas, rivalling Handel for a time. He was court composer at Vienna for 10 years. He wrote the second act of the famous pasticcio *Muzio Scevola* (an operatic medley performed in London 1721, and of which the other acts were written by Metel and Handel). For some time he shared with Handel and Ariosti the directorship of the operatic enterprise known as the Royal Academy of Music, but was later induced to run a rival house by the nobles who opposed the king. He wrote 7 oratorios and many operas, including 8 for London and about a dozen for Vienna.

Bononcini, Giovanni Maria (1642-78), It. composer, b. near Modena; studied in Bologna, entered service of Francis II, Duke of Modena, and became *maestro di capella* of San Giovanni in Monte. Wrote many instrumental and vocal compositions, and the theoretical work, *Musico pratico* (1733).

Bonomia, Rom. name for (1) Bologna, Italy, (2) Boulogne-sur-Mer, France (qq.v.).

Bonpland, Aimé Jacques Alexandre (1773-1858), Fr. traveller and botanist, b. La Rochelle on 22 Aug. He studied medicine, and for some time served as an army surgeon. In 1799, together with Humboldt, he undertook a journey of exploration through Mexico, Columbia, and the dist. round the Amazon. The result of this journey was the collection of about 6000 plants, which on his return to Europe he proceeded to explain in his *Plantes équinoxiales*. Later he explored central America. Among his works may be mentioned *Monographie des Melastomacées*, 1806, and *Description des Plantes rares de Navarre*, 1813.

Bonsignori, or Buonsignori, Francesco (1455-1519), It. painter, b. Verona. Many of his works remain at Mantua and Verona, and some are to be found in the prin. European galleries. Vasari declares him to have been a pupil of Mantegna. His best-known works are paintings of the Madonna with saints at Verona, and portraits at Florence. See Vasari's *Lives*.

Bonstetten, Albert von (c. 1441-1509), Ger. monk and author, a member of the Einsiedeln monastery of the Benedictine order. His numerous works include *Descriptio Helvetiae*, 1478, *Poema de justitiae et ceterarum virtutum exilio*, 1479, *Historia austriaca*, 1491, and a detailed hist. of Einsiedeln.

Bonstetten, Charles Victor de (1745-1832), Swiss writer and publicist, b. Bern. He was educ. at first at home, but afterwards at Leyden, and later in England,

where he became a friend of the poet Gray. On his father's death he entered political life, and became a dist. governor. But his ideas were too liberal, and after the taking of the Bastille he had to retire. In 1795 he again became a governor of the It.-speaking part of the rep., but again in 1798 had to retire because of his political opinions. He then spent some years in Denmark, and finally settled in Geneva in 1803, where he d. One of his greatest books was the study of the effect of climate upon different nationalities, *L'homme du midi et l'homme du nord*, 1824. Other works are *Recherches sur la nature et les lois de l'imagination*, 1807, *Études de l'homme*, 1821, and *Pensées diverses*, 1815.

Bontempelli, Massimo (1878-), It. author, b. Como. He began his career as a prof. of letters and a convinced follower of the classical methods of Carducci. In this period he wrote his *Sicilian Odes*, inspired by antiquity. He then became a futurist and humorist. In 1926 he founded the review *900*, in which he vigorously preached reaction against academic art and sentimentalism. His book *Lady of my Dreams* is composed of short stories relating imaginary adventures in an ultra-modern world, but with infinite care for realism in their details. He himself describes his art as 'magic realism.' Other novels are *La Vita Intensa*, 1920, *Gente nel Tempo*, 1937, and *Giro de Sole*, 1940.

Bontuku, tn of W. Africa, in the Fr. colony of the Ivory Coast, situated some 200 m. inland, near the W. border. It was placed under Fr. protection by Capt. Binger (q.v.). Pop. 4000.

Bonus, sum paid to shareholders in a joint-stock company as addition to ordinary dividends. It is generally given out of accumulated profits, or the profit from some exceptional transaction, when it is not considered advisable to raise the ordinary dividend. As used by insurance companies it is an amount added to the original amount of the policy by a distribution *pro rata* of the accumulated profits, or of the surplus. In a more general sense B. is used to mean any payment of more than what is due.

Bonvin, François (1817-87), Fr. artist, b. Vaugirard. Most of his pictures have for their subjects incidents in the life of the working people with whom he had come into contact. Among his best-known pictures are 'L'École d'orphelins,' 'La Charité,' 'La Basse Messe,' and 'La Cuisinière.'

Bony Fishes, scientifically known as Osteichthyes, the largest and most important class of fishes. The other classes comprise the lampreys and hagfishes (Cyclostomata) and the sharks, rays, and chimaeras (Elasmobranchii). There are 2 main groups of B. F., the first the tassell fins, Crossopterygii, consisting of the lung fishes (Dipnoi) (q.v.), the Osteolepidoti and the Coelacanthini. The osteolepids are only known as fossils but the coelacanths have one living representative, *Latimeria* (q.v.). Typically the tassell fins have paddle-like paired fins with well-developed, scaly, muscular bases fringed

by the fin rays. The other group of B. F., the Actinopterygii, the 'ray fins,' do not have such bases to the paired fins and the fin rays originate at the level of the body. The ray-finned fishes are divided into the Palaeoniscoidae, Subholostei, Holostei, and Teleostei. The palaeoniscoids are mainly a fossil group, common during later Devonian, Carboniferous, and Permian periods and are only represented to-day by the birchirs (*Polypterus*), reed fishes (*Erpetoichthys*), sturgeons, and paddle fishes (*Chondrostel*). The Subholostei are entirely a fossil group, abundant during Triassic times and were succeeded by the Holostei. However, the only surviving holosteans are the bow fin (*Amia*) and the garpikes (*Lepisosteus*) of N. and central America. The main group of Actinopterygii is the Teleostei (q.v.), consisting of about 25,000 living species and ranging from the herring and salmon-like fishes (Isospondyli) to the angler fishes (Pisculati). The teleosts are thus by far the most diverse group of living B. F.

B. F. are characterised by having a skeleton of true bone and typically some kind of swimbladder is developed. The sharks and rays and the lampreys and hagfishes have no swimbladder.

Bony Pike, Billfish, or Garpike, name applied to the fishes of the family Lepisosteidae. They have elongated snouts, their bodies are covered with thick scales, and in habit they are predaceous. *Lepisosteus osseus* is a species commonly found in fresh waters of N. America. Like the mud fish (q.v.) the garpikes belong to the Holostei, a group of bony fishes.

Bonyhád, tn of Hungary, in Tolna co., 9 m. SSW. of Szekszárd (q.v.). It has a trade in corn, vegetable oil, wine, and tobacco. Pop. 8500.

Bonze (Jap. pronunciation of *fan sang*, member of a monastery), member of a Buddhist monastery. The Jap. form is *bonzo* or *bonzi*. The word used to be applied by Europeans to any priest in Japan and China.

Booby, species of bird which is closely connected with the gannet, and receives its humiliating name from the ease with which it allows itself to be captured. With the gannet it forms the genus *Sula* of the family Sulidae, but it differs from the gannet in breeding on trees and bushes, and in having no feathers on its throat and lower jaw. It is persecuted by the frigate or man-of-war bird, which belongs to a different genus of the same family, and is compelled to give up to it the fish which it has captured. The birds are cosmopolitan except on cold shores; *S. cyanops* comes from the S. Pacific, and *S. australis* from the S. seas.

Booby Island is situated in Torres Strait, off Queensland, Australia. It is dangerous to navigation, and a lighthouse has been built here.

Book, name given to a literary production, usually 1 vol., and also to sev. if forming a single work. The word has been variously derived, but the derivation which presents least difficulties is that from A.-S. *boc*, meaning a beech-tree, supposedly from the original use of beech

bark for writing. Almost as far back as it is possible to trace any form of civilisation, it is possible to trace the existence of B.s of some form. The clay tablets, with cuneiform inscriptions recording decisions of the law courts of Babylonia, have a right to rank as B.s. More in the direct line of descent are the papyrus rolls of early Egypt, covered with hieroglyphics, and of great antiquity, the earliest extant papyrus (q.v.) dating back to some 4000 years BC. The fashion thus set of recording events on papyrus was one which remained in existence for a long time, and as late as the 13th cent. papyrus was still used as a medium for writing. The Greeks gave papyrus the name of *biblos*, from which is derived the word 'Bible.' The supply of papyrus was at one time found to be declining, and the prepared skin of sheep and goats was brought into use as a substitute, proving so successful that it was only replaced later by the invention of paper, which was introduced from the E., and to which the name papyrus was transferred. The method of preparing the skins was traditionally ascribed to Eumenes II, King of Pergamum (or Pergamus); hence the name parchment, from Lat. *pergamena* (*charla*), paper of Pergamum. During the period of the predominance of papyrus the usual form of B. was the long roll wound round a stick, but with the commoner use of parchment the B. form as we now know it began to be used. With the coming of printing the form of B.s did not at first undergo any great change. The type used was similar to the calligraphy which had been usual up to that time. B.s were first printed without title-pages, and the information about the printer and place of printing was given at the end of the B. It was not until the beginning of the 16th cent. that B.s began to be given a title-page, together with the name and address of the printer and the date. The early printed B.s were large, and owing to the method of binding heavy as well. During the 16th cent. the introduction of smaller type, and the reduction in the size and weight of B.s, did much to popularise them, and many B.s during this period were brought within the reach of ordinary people. The early 17th cent. saw a falling off in the printing of B.s, which increased in price. Towards the end of the cent., however, B.s began to improve in printing, although they did not cheapen. The 18th cent. saw a great improvement in the printing and binding of B.s, and prices of B.s again became reasonable. B.s were often pub. by subscription (i.e. sale before printing, or even before writing, by means of preliminary notices), and then the price was high. Illustrations began to appear in them, and it is during this period that we get the beginning of the popularity of the novel, which was usually printed in sev. vols. The price of B.s during the greater part of the cent. was fairly uniform, and B.s could be bought by all classes save the very poor, but towards the end of the cent. the prices again rose. The 19th cent. saw a vast improvement in every respect. B.s were well bound, well

printed, and in many cases well illustrated. The publishing of B.s at popular prices began, although cheap B.s were as a general rule not well printed or well bound. With the turn of the cent., however, the continuous advances in technical and mechanical efficiency in both printing and binding at last brought the well-produced and cheap B. within the reach of all. *See also* BOOKBINDING; BOOK-COLLECTING; BOOKSELLING; MANUSCRIPTS; NATIONAL BOOK LEAGUE; PRINTING; PUBLISHING.

Bookbinding, process whereby the leaves of books are bound together in such a manner as to keep them in order and protect them from injury. It may be said to have begun when the method of making books from strips of parchment wound round rollers at each end was superseded by the method of fastening leaves together at the back and placing the so formed book between covers for protective purposes. Before the days of printing, as early as the 6th cent., the monks had carried the binding of MSS. to a very high plane. They bound the MSS. between boards, which were afterwards decorated with metal and jewels. This was known as the Byzantine style of binding. The majority of the books so bound were destroyed by people seeking for gems that were supposed to be hidden in their covers, which were made of wood of great thickness. Then between the 10th and 14th cents. the monks of England, having copied and improved the designs of books brought from the E., became the foremost binders of Europe. The binding of books was now done by the aid of leather stretched over the boards and decorated with the impress of small stamps bearing the conventional designs.

But the introduction of the printing press gave a great impetus to the trade of B., and as the number of books increased so the office of bookbinder became separated from that of printer. This, together with the introduction into Venice from the E. of the use of gold leaf in the decorating of bindings, caused the end of the 15th and beginning of the 16th cents. to be one of the finest periods in the history of B. At this time morocco leather was first used, and with the aid of fine, delicate tools for impressing designs on covers, the result was the foundation of an exquisite art for the decoration of bindings. Venice was the seat of this rich ornamentation, and the distinct character of the designs originated there gives rise to the Venetian pattern of tool. Some of the most celebrated patrons of the art in Venice were Tommaso Maloli, Aldus Manutius (q.v.), founder of the Aldine Press, and Jean Grolier (q.v.) of Lyons, sometime treasurer to the duchy of Milan. When Grolier returned to France, he had his books bound under his own supervision in such a manner that they cannot be equalled even to-day in beauty of design or in excellence of workmanship. The Fr. school of binders, led by Nicolas and Clovis Eve in the 16th cent. Le Gascon and du Seuil in the 17th, and the Padeloup and Derôme

families in the 18th cent., ably followed up the impulse given in France by Grolier, and kept in unrivalled until the end of the 18th cent. In Germany the books were usually bound in pigskin, vellum, or calf; the latter being preferred for its softness and smooth surface and its great advantages for blind-tooling, i.e. the impression of designs without the use of gold.

In England the men who stand out pre-eminently are of comparatively recent times. While we may mention Thomas Berthelet, binder to Henry VIII, and John Gibson in the reign of James I, yet chief notice must be paid to Samuel Mearne, binder to Charles II, who originated the 'cottage' style of ornamentation. In the 18th cent. Robert Harley, Earl of Oxford, had books bound in red morocco with centre panels surrounded by a broad tooled border, so founding the Harleian style. Other names to be noted are Baumgarten and Benedict, Kalthoebler (credited with the introduction of painted edges, though according to Zaehnsdorf he rediscovered the secret if it had been lost, for it had certainly been done in the 16th cent.), and Staggemeir. At the end of the 18th cent. Roger Payne used original artistic tools of his own design, always finishing his bindings in accordance with the character of the book. These were followed by Lewis, Mackenzie, Hayday, and Zaehnsdorf. After a period of stagnation and imitation an artistic revival in printing at the end of last cent. owed its inspiration to Wm Morris, though the virtual founder of the modern school of binding was T. J. Cobden-Sanderson, of the Doves Press and Bindery. Later names that may be mentioned are Douglas Cockerell, a pupil of Cobden-Sanderson, Charles Ricketts, and Miss E. M. MacColl.

HANDICRAFT BOOKBINDING. Large eds. of books, bound in cloth, are produced by machinery. Since this process differs materially from that of leather binding, the ordinary cloth binding should be described as casing, and the term binding reserved for the process when the boards are attached to the book before covering. In casing the boards are covered and then glued to the book. Nearly all branches of B. to-day can be performed by machinery, but we first describe the various operations of handicraft B. before referring to modern machine methods, because these latter have been evolved from the handicraft processes.

Folding. Books are usually received from the printers in sheets which require folding. On each sheet is an alphabetical letter or 'signature' to denote the order of appearance in the book. From the number of folds in a sheet a book is known as a folio, quarto, octavo, duodecimo, etc. Folio implies 1 fold down the centre, or 2 leaves to the sheet. Quarto (4to) refers to sheets folded again across, making 4 leaves to the sheet. Similarly, octavo (8vo) means 8 leaves to the sheet. For folding by hand, the only instrument used is a folding stick, made of wood or bone, shaped like a paper-knife.

Gathering. When the sheets have been folded into sections, then they have to be

gathered into books. The usual way of gathering by hand is by laying piles of sections on a long table, a section being taken from each pile in turn. After gathering, the book must be collated, i.e. looked through to see that there are no sections misplaced or pages out of place.

Sewing and stitching. Hand-sewing is done on a press which has a crossbar from which are suspended vertical lay cords. These cords are then fastened to keys. Through small holes in the backs of the sections the threaded needle is passed round these cords, so fastening the section to the cord. The sewing thread is continually joined up, so that it is continuous through the whole book. When the back has been sewn in, then the sewing thread is merely passed up through the centre of the section and over the binding cord.

Trimming. Most books are now bound with cut edges. In these cases, after sewing, the book is placed either in a press and cut with a plough, or, as is the case with large outputs, in a guillotine. A guillotine consists of a bed upon which the book is placed and adjusted by gauges, and securely held down by a clamp. A knife then descends which cuts the edge accurately at the places which have been marked. When the front edge has been cut, the head and the tail may be treated in the same manner.

Gluing up. The books are now knocked up until they are square, and they are then placed between gluing boards, and a coating of glue, which is not too thick, is spread over the back; the object of this is to aid in the holding of the sections together, and to make the back firmer to withstand the rounding and backing processes.

Rounding. The trimmed books have now to be rounded. The purpose of this is to prevent the back sinking in. The book is taken when the glue is not quite dry, or the glue is moistened slightly. The book is then pulled into a round shape with the left hand and hammered with the right until it takes a rounded form. This is performed on both sides of the book and requires great care. Not all books are rounded, some having 'flat' backs.

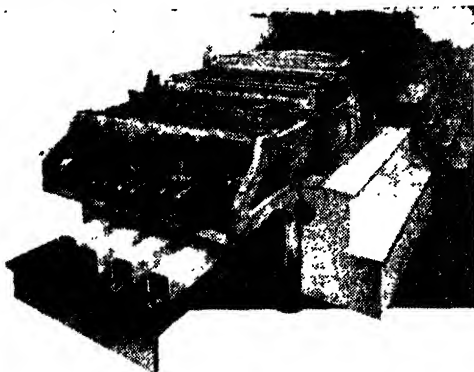
Backing. The book has now to be backed, or grooved, so that the boards may turn on them as on a hinge, and may fit closely against the sides. Therefore, according to the thickness of the covers, the groove must be made deep or small. The book is placed between 2 backing boards with the back slightly projecting, and the book adjusted until the rounding is even and the head and tail seen to be rectangular. The whole is now fixed in a press in such a way that the back will fall outwards, forming a sharp groove. It is then hammered into position on both sides.

Decoration of edges. Ordinary cloth-cased books have either plain trimmed edges or are deckle-edged, i.e. rough and uncut. But as in the case of leather-bound books the edges may be decorated in a number of different ways, to prevent

the soiling which must happen with white edges. The edges may be sprinkled with spots or one or more colours. A simple sprinkling of one colour is obtained by letting drops of the paint fall from a brush rubbed on a fine sieve. When 2 or more colours are used then sand is spread over the edges to keep some portions protected from the colour. Again, edges may be coloured plainly, in which case the colour, mixed with water, is spread over the edges with a sponge or brush. One of the finest methods of decorating edges (much used for account books) is that known as marbling. This is a special branch of the trade and depends upon the fact that colours mixed with ox gall will float upon a sized surface, and a colour containing more gall will force the first off. The smooth edge of a book will take these colours up, so the marbling is prepared in a trough and the edge of the book dipped in it diagonally from corner to corner. This must be done before the book is rounded, or, if after, then the book must be knocked back for the process. There are many recognised varieties of design in marbling, the commonest of which is comb or feather marbling. The most elaborate system of decoration is gilding. This is performed by placing the book in a press and scraping the edges smooth with a steel scraper. A mixture of black-lead and glair—white of egg beaten to a froth in water—is then brushed over the edges, and when this is dry the gold leaf is laid on the edge from the gold cushion to which it has been transferred from the gold-leaf book with a gold knife. The gilder then polishes the book edge with a highly polished agate or bloodstone.

Casing. A lining of mull (gauze) having been laid on the back of the book to strengthen it, the covers are now prepared from strawboards, coloured cloth, and stiff paper for the back. After being cut to the size required, the cloth is glued carefully and the backing paper and boards laid on; the edges of the cloth being cut at the corners, to prevent thick folds when it is turned over the boards. After these covers have been titled (see *Embellishing* below) they are pasted to the books and pressed, after which the cloth-cased book is ready for use.

Leather binding. With leather the process is different in most cases. Although sometimes the leather covers are made separately and placed on the book complete, yet the proper method of true binding is that by which the covers are built up around the book. To the book in the state already described under the decoration of edges, head bands are added of vellum or catgut covered with silk or cotton, or of calico over cord. The purpose of these is to prevent too great a strain coming on the book when it is being taken from a shelf. Bands—5 as a rule—of leather are now pasted or glued on the backs of the books. The mill- or straw-boards are fastened to the book by lacing the sewing lay-cords through the boards, or inserting them in the thickness of the boards (i.e. split-boards). In the

**FOLDING**

In the folding machine flat printed sheets are fed automatically through a series of rollers and folding and slitting knives. The sheets emerge, in book size, as 4 sections of 16 pages each or 2 sections of 32 pages each. They are now ready for illustration plating or endpapering before gathering.

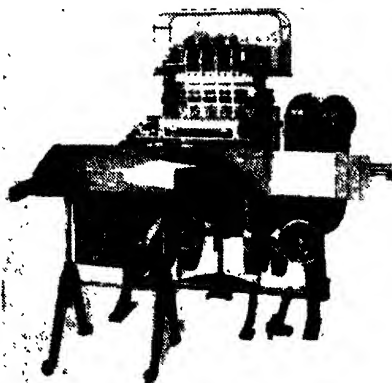
Camco (Machinery) Ltd

GATHERING

This gathering machine has 24 'stations,' hoppers into which separate stacks of each book section are loaded loose. Suction devices draw the sections down to a reciprocating table, thus assembling them in book order for delivery and checking or collation. The collated books are stacked for sewing.



J. M. Dent & Sons Ltd

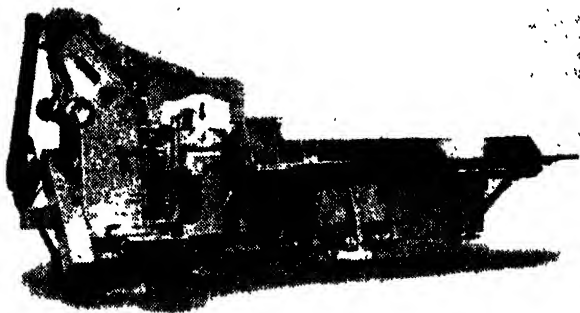
**SEWING**

Book sections are placed by the operator on a saddle to permit the needles and thread accurately to pierce the fold in the back of sections. This machine sews them together in a continuous stream, and they are separated into books by another operator as they come out at the rear of the machine.

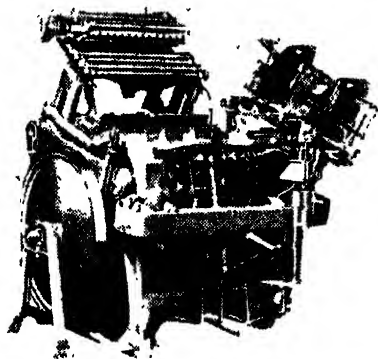
Smyth-Horne Ltd

TRIMMING

The book edges are cut to remove folds and make the edges even. This continuous trimmer cuts first the front edge, then the heads and tails.



Smyth-Horne Ltd

**BLOCKING**

This press, a modified printing machine, impresses from a brass stamp the title lettering or other decoration on the binding case formed of strawboards and cloth in another machine. Pressure suffices for ink blocking, but for gold and foils heat is necessary also. The machine has mechanical 'arms' for picking up the cases and placing them in position for stamping. Gold, ink, and metallic or pigment foils may be used for the title or design.

C. F. Moore & Sons Ltd

CASING-IN

In this machine a coating of paste is applied to the sides of the book and the back of the case is rounded. It is then positioned over the book and rollers press them together. The cased book is then delivered to a chute.



Smyth-Horne Ltd

case of books which have a flexible back, the leather is fastened directly on to the book, and it consequently adheres to the back of the book, although it is flexible enough to allow of the book opening.

Coverings. Bound books are covered with either split sheepskins, sheepskins, morocco, or any other leather, parchment, vellum, cloth, velvet, and imitation leather. Special processes are required for each of these. Those bound in leather may be either bound in whole leather, or half bound, having the corners and back made of leather and the sides of cloth or paper. The third type is the limp type, which has the cover flexible and pasted directly to the back of the book. After the covering has been put over the boards the end-papers are pasted down to the boards and the inside covered with paper.

Embellishing. When small ornaments are used and made up into design, it is known as hand-finishing, and when a large design is used then the process is known as blocking. In either case the tooling may be blind or gold. Gold tooling is performed by pressing gold leaf on to a specially prepared surface and brushing off the gold leaf not stamped on. Blind-tooling is merely an impression on the leather or other cover, without any colour whatsoever. Blind-tooling is sometimes termed antique or monastic tooling.

Bible bindings are largely in leather, and offer facilities for a display of taste on the part of binders, owing to the custom of having rounded corners, limp, soft corners without flaps, or yapp—soft with flap—covers, specially gilded edges, and tasteful linings for the covers.

Commercial and library books. The sewing of books which are intended to last for a considerable time and which are well bound is still done usually by hand; but a good deal of the sewing of most other books is now done by a book-sewing machine, chiefly with tape supports. The style of binding usually adopted for thread-sewn books, like common bill books, is 'quarter-binding,' which consists of boards with a coloured paper finish and cloth up the back; stout strawboards are glued on the end-papers, strips of cloth up the back, and the books are trimmed round. But superior quarter-bound books, after being sewn, are trimmed in a guillotine; the backs are then well glued, and before the glue is set the back and fore-edge are nicely rounded. This operation is now frequently performed by a rounding machine. Before the covers are put on, the backs are strengthened by adding cloth or leather strips—leather or imitation leather is generally used for covering the back, and cloth or marbled paper for the sides; and these are 'turned in' to give a more finished appearance than is possible with the cheaper bindings, the result being that no boards are visible. The make-up of a half-bound book is superior to that of a quarter-bound book in every way; quarter-bound books are always fitted with flexible backs, but the back of a half-bound book, whether an account and general commercial book or any

other, is firm and substantial, and when the book is open there is an air space between the leaves and the cover back, which space is called a 'hollow' or 'open' back and ensures durability. Half-bound books have leather corner pieces in addition to the leather back, and the covers are heavily built; the end-papers at beginning and end consist generally of highly decorated marbled paper. Sometimes, instead of being marbled, edges are simply sprinkled, a less costly but not so attractive or finished process. It may be noted here that many library books have their marbled or sprinkled edges burnished, the process being effected by a burnisher, generally in the form of a specially shaped agate in a wooden holder. Russia leather bands are 'laced' on to some types of full leather bindings, but only for books which are for exceedingly long currency. When once the covers are fixed, the books are sent to be 'finished' and 'polished up,' and to have the lettering and ornamentation added to the backs and sides. The lettering and marking tools are of brass; those for rolling are circular, with the design cut out on the circumference and mounted, and they revolve as the tool is played forwards and backwards. The leather of the cover is sponged over with glair, and, when dry, gold leaf is applied and finally the cover is given a coat of varnish.

MODERN MACHINERY. Handicraft B. is to-day a small and specialised trade. The great mass of books are produced mechanically, and automatic machines play a leading part in their manufacture. For journals, and some cheaper grades of bookwork, web and rotary printing presses include the work of folding; then a single machine undertakes the work of assembling the sections, gluing paper covers, and trimming and cutting edges. There are also, *inter alia*, case-making machines; blocking presses for imprinting titles and designs in ink, pigment, foil, or gold on the binding case; various forms of three-knife trimmers for edge trimming and cutting; machines for lining or reinforcing backs; and casing-in machines for fastening the book to the covers. Some of these machines are linked in modern production-line technique in the larger binderies. The accompanying illustrations show machines used in modern mass production B.

Case work now embraces almost all the novels, travel books, etc., which are produced in great quantities; but the result often means books of less strength. Such books are printed so that they may be easily folded into sections with a definite number of pages to each, and the folding is done by special machinery which may take a 64-page sheet, slit and fold it into 4 sections of 16 pages each or 2 of 32 pages each, delivering them from the different parts of the machine at seven thousand sheets an hour. Illustration plates are inserted, usually by hand, and cartridge end-papers are applied to the first and last sections by machine. Each section bears a 'signature' to facilitate rapid gathering and collation during

'making up,' and the gathering, too, is often done by special machinery. After the sections are sorted they are thread-sewn by machine, the books are nipped to make them solid, glue is applied to the books, and after trimming of the edges they are ready for rounding and backing; the latter process is to give a nicely rounded effect to the back and to the fore-edges of the book. 'Rounding' is related to the sewing and is intended to overcome the difficulty of the increased back-space caused by the threads, and is now done by a rounding machine.

The covers of these case-work books are made separately from the books themselves, and generally by a case-making machine. The term 'case' refers to a cover of strawboard and cloth made separately and into which the trimmed, rounded, backed, and mull-lined book of sewn sections is pasted by means of the end-papers. The making of the case and the titling and decoration are done apart from the unbound book, and 1000 cloth cases an hr can be turned out on some of the machines now in use. Whatever lettering is required is also done by machinery, in a blocking press by which gold, metallic or pigment foils, or ink, are impressed in the case. Cases are blocked in colours as well as gold-blocked, although keen competition has modified the use of gold leaf. A wide range of decorative or pictorial effects can be obtained by printing cloth before case-making. The cases are applied to the books in a casing-in machine which applies adhesive to the end-papers on the sides, and pushes the book into the case, the back of which may have been rounded on the same machine.

Unsewn or threadless binding. The modern demand for the reduction of costs in B. has led to the devising of machines which produce books without sewing. In this process the books are assembled, the backs or folding points are sawn off and the resulting loose pages glued together on the back. They can then be reinforced with a strip of calico and covered with a paper cover for the acceptable markets, or the books may then follow the traditional rounding and backing and casing-in processes. The development of extremely strong adhesives has added this form of simplified binding which, however, is not yet universally accepted as a completely satisfactory substitute for sewing.

Materials. Modern B. production makes use of a number of substitutes for cloth and for this purpose various different grades of strong paper have been produced. The qualities of leather have been simulated by the plasticising of linen or cotton bases, producing a material widely used for more expensive books, or reference books.

See J. W. Zaehnsdorf, *The Art of Bookbinding*, 1903; D. Cockerell, *Bookbinding*, 1905, *Some Notes on Bookbinding*, 1929, and *Bookbinding and the Care of Books* (5th ed.), 1953; G. D. Hobson, *English Binding before 1600*, 1929; D. Leighton, *Modern Bookbinding*, 1935; A. J. Philip,

The Business of Bookbinding, 1935; J. S. H. Bates, *Bookbinding for Schools*, 1941; C. Ede, *The Art of the Book*, 1939-1950, 1951.

Book Clubs. There are various kinds of B. C.: for the purchase and reading of various books, for the printing of books in connection with a certain subject or study, and for the sale of books to members. Formerly many clubs used to be formed for the purchase of the best works of the day as they issued from the press, and for the distribution of them in turn among the members. The books thus bought were sold annually, and the proceeds carried forward.

Another kind of book club for the printing of books still exists in this country and the U.S.A. As first founded they were largely convivial clubs, holding dinners at intervals. Each member was bound to defray the cost of reprinting as many copies of some scarce work as there were members in the club; the chairman's copy was generally printed on vellum. The oldest of the B. C. is the Dilettante Society, which dates from 1734; another long-estab. club is the Cymmrodorion, or Metropolitan Cambrian Institute. The first book club to be carried on after modern methods was the Roxburghe Institute, instituted in 1813. Other famous B. C. are the Bannatyne Club, founded by Scott in 1823, the Maitland Club, the Abbotsford Club, and the Camden Society.

The book club as it is known to-day is a scheme for supplying to enrolled members special eds. of new books at regular intervals. The idea was put into being in a large way in the U.S.A., the Book of the Month Club, formed there in 1926, achieving eventually huge circulations. It was quickly followed by other B. C. in the U.S.A., notably the Literary Guild, which also has a vast membership. On the Continent, notably in Germany, the movement flourished in the same period. In England the Book Society was formed in London in 1929, its committee of literary critics selecting each month for the society's members a choice of one new book and 'recommending' sev. more books. The chosen book and the recommended books are made available for sale to members at the same time and at the same price as the ordinary ed. is first pub., and a jour. is given to members. Specialised B. C. followed with certain variations, notably political and religious B. C., and a variation of the purely literary book club was instituted in 1937 by Readers Union, which provides its members each month with a special ed. of a book which has been pub. one year or more, the price to members being lower than that of the regular ed. Among other B. C. operating with a large membership on similar lines are World Books (the Reprint Society), Foyle's Book Clubs, and the Companion Book Club. There are also sev. of these 'reprint' B. C. in the U.S.A.

Book-collecting. The value of a library must depend almost entirely upon the skill of the particular collector. B. assumes many forms, but there is usually

some central idea dominating the bringing together of a mass of books, coupled with the adoption of some method of classification. Some collectors are attracted almost solely by the rarity of a book, others by the age; others by the lure of a first or early ed., by the splendour or tastefulness of the binding, while some desire to bring together as many books as possible on certain specific subjects either for their own edification or with a view to ultimate transference to the public. B. in the true sense must be distinguished from the formation of a public or working library. Finally, a book-collector is rarely nowadays a 'biblio-maniac,' or person who, regardless of its points, collects, yet never reads, any book that happens to strike his fancy. An excellent list of rare, curious, and valuable books, compiled by a bookseller who was evidently anything but a biblio-maniac, is to be found in *A Journey Round the Library of a Bibliomaniac*, by Wm Davis, 1821. It is often said that the element of rarity is over-estimated by book-collectors. In this connection it is not far from the truth to assert that rarity does not depend on the number of copies originally printed, but rather on the belief that any particular book is not, or will not in the future be, easily procurable. An illustration of this, given in Slater's *Library Manual*, is furnished by the celebrated 'Elzevirs,' or books printed by Louis Elzevir of Leyden, who flourished in the 16th cent. Although the market was for that period flooded with 'Elzevirs' they never became very common, though the vogue of 'Elzevirs' has fluctuated and decreased rapidly in this cent. B. in the modern sense is generally said to have originated in the public-spirited action during the Tudor period, after the dissolution of the monasteries and the plundering of the monastic libraries, of Archbishop Parker and Sir Robert Cotton, who made it their business to rescue as many of the books as possible. A number of modern collectors owe their treasures to the purchase of old libraries belonging to private owners. The tasteful bindings of Grollier (q.v. and see also BOOKBINDING) and other Fr. and also It. bookbinders which appeared after the Renaissance, probably added a stimulus to a form of B. Impetus was given to B. by the introduction from Holland towards the end of the 17th cent. of the custom of selling old books by auction, and the hobby of B. quickly became fashionable. Prices have fluctuated from time to time. The close of the 19th cent. saw a rapid increase in the prices of specimens of early printing, illuminated MSS., first eds. of Eng. classics, and the earlier Fr. and It. printers. Caxton's, however, have more than held their own, and prices have increased during the last hundred years from three to four figures. Some of the most celebrated sales held in this country include those of the Libraries of the Duke of Roxburghe in 1812; Wm Beckford (author of *Vathek*) in 1823; Richard Heber in 1834-7; the Earl of Sunderland in 1881; the Earl of Ashburnham in

1897-8; and Lord Amherst of Hackney in 1908-11. The Huth library, formed by Henry Huth (1815-78), was dispersed in 9 portions, 1911-20; and the Britwell Court library, after passing to Mr Christie-Miller, was sold in batches, 1916-27 (not all by auction). The collection of Americana in the Harmsworth Trust library was sold between 1948 and 1953, and the André de Coppet collection of the letters of Napoleon in 1956. In 1933 the Rosebery copy of Shakespeare's First Folio fetched £14,000; a fine copy to-day would fetch nearer £20,000. The highest price ever paid at an auction for a printed book was \$151,000 in 1947 in New York for a copy of *The Bay Psalm Book*, Cambridge, Mass., 1640. In 1951 the Shuckburgh copy of the famous Gutenberg—or 42-line—Bible was sold for over £40,000. It is now in the private collection of Arthur A. Houghton of New York. Other famous book-collectors of the 20th cent. include T. J. Wise (q.v., Eng. poetry), Dyson Perrin (early printed books), Chester Beatty and Yates Thompson (MSS.), Joseph Lilly, and Carl Pforzheimer. Three great Amor. collectors who have now institutionalised their libraries are J. Pierpont Morgan in New York, Henry Huntington in San Marino, and Henry Clay Folger at Washington—the last two excelling in Shakespeariana.

For full information as to prices see the ann. vols. of *Book Prices Current* and *Book Auction Records*. See also R. B. McKerrow, *An Introduction to Bibliography for Literary Students*, 1928; P. H. Muir, *Book-collecting as a Hobby in a Series of Letters to Ferryman*, 1944; J. Carter, *Taste and Technique in Book-collecting*, 1948, and *ABC for Book-collectors*, 1952. See also BIBLIOGRAPHY and LITERARY FORGERIES.

Book Illustrations, see ILLUSTRATION.

Book-keeping, science of recording commercial and pecuniary transactions in a systematic and accurate manner, that will preserve a distinct record and thus enable one at any subsequent date to understand their nature and effect with clearness and expedition, and also enable one to ascertain the exact state of the financial position of a business. All transactions should be correctly entered, as the stability of a business depends on the accuracy of its books, for these may be regarded as a mercantile chart, by a reference to which a merchant should be able to obtain information as to his trading; whether a certain dept is paying or worked at a loss, and whether his business is improving or likely to lead him to the bankruptcy court. Inefficient B. may often be the cause of bankruptcy. Bankrupts are liable to be penalised for keeping unsatisfactory books (the Bankruptcy Acts, 1883 and 1890). Companies registered under the Companies (Consolidation) Act, 1929, are compelled to keep at least 5 statutory books, and have their books audited annually by a public accountant. Under Section 26 of the Companies (Consolidation) Act, 1908, it is obligatory for a public joint-stock company to submit an ann. statement in

the form of a balance-sheet, audited by the company's auditors, to the Registrar of Joint-Stock Companies. The latest provisions regarding Auditors and Accounts of Companies are embodied in the Companies Act, 1948. Earliest known treatise on B. was by Lucas de Burgo, 1494, but the subject can be traced to the introduction of barter. At that time, whenever the transactions involved credit, traders had recourse to the elementary form of the notched stick, or chalk marks on a handy rock. In the 15th cent. the great mercantile cities of N. Italy, at that time the chief commercial centres of Europe, adopted the principles of double entry (*doppia scrittura*), and this system, under the name of the It. method, gradually made its way over Europe, many of the original names still being used in the practice of the science. The double entry system first appeared in England about the beginning of the 17th cent., and sev. books were produced on the subject, but only contained a modified version of the It. method. There are one or two different systems of B., and the so-called single entry is but an unsystematic, unreliable, and often misleading method. It merely consists of personal accounts, which only enable a trader to ascertain with whom he trades, and a mass of incomplete memoranda from which it is almost impossible to discover whether a profit has been made or not. The double entry system is mathematically correct in its results, and gives a complete statement of all business dealings. The books kept by a merchant vary according to his business, and on taking up the study of B. one is not taught how to keep the books of a particular trade such as those of a cloth merchant, wine merchant, or publisher, but the principles that will admit of general application to modern business, and this knowledge an intelligent person will have no difficulty in applying to any specific business. The chief books used in a firm keeping their transactions and accounts by the modern method are:

Private Ledger. This contains the records of the capital and 'drawing,' and the profit and loss accounts; thus if there are 2 partners in a firm, each contributing as capital £5000, the respective amounts would be credited to separate 'capital accounts.' The heading would be *Merchants' Capital Account*, and the amount of cash paid in by 1 partner would be entered on the right hand (credit) side; first the year and date, then 'by cash £5000,' the same proceeding being employed for the other partner. **Drawing account:** In this would be entered on the left-hand (debit) side the sums drawn out by the partners, and on the credit side the interest allowed on the capital of each partner, and also the share of the profit realised or loss sustained; when the drawing account is balanced the difference should be transferred to the respective capital accounts of the partners. **Profit and loss account:** To this would be debited all the trade expenses, and on the credit side one would

have the gross profit, the difference of course, as previously stated, being transferred to the drawing account.

The *Cash Book* is practically a part of the ledger, which is separated for purposes of convenience. In modern B. it is always taken for granted that the cash book is separate from the ledger, and is used alone for entering cash receipts and payments; as this is an integral part of the ledger, all items in it are separate halves of twofold entries; thus cash coming in from John Jones, £6, would be entered in the cash book on the debit side, and posted (the act of separately transferring the entry to the account which such an entry affects in the ledger). This would make the double entry. Thus we see that every entry that is debited in the cash book is credited to a corresponding account in the appropriate ledger, and vice versa. It is the practice of a cashier to enter cash receipts from the accompanying statements or cheques, and the payments from the memoranda or counterfoils in the trader's possession; then the corresponding entries (debit or credit) are made as soon after this as possible. The cash book should be balanced monthly, checked by the balance in hand, at bank, and brought down. It is advisable to prepare a reconciliation statement, showing how the balance is made up, thus:

Cash receipts, as per cash book	£2000	17	6
Cash payments, as per cash book	1560	4	6
Balance	£440	13	0
<i>In hand—</i>			
Notes	£10	0	0
Silver	5	10	6
Copper	0	0	6
	£15	11	0
<i>At bank</i>	425	2	0
	£440	13	0

The *Sales or Day Book* is used daily to record particulars of goods sold on credit, and is usually in an analysed form to facilitate the dissecting and summarisation of a variety of goods; thus, by employing a system of grouping the different sales, the merchant can tell at a glance what particular dept or class of goods is selling the most. A simple form of analysed sales book would be required by a trader dealing in corn, flour, and maize; it would be constructed as specimen on p. 388. When the particulars of an order have been entered in the sales book, the invoice should be made out therefrom and dispatched to the customer, then the entry should be posted to the debit side of the customer's account in the ledger; this makes the double entry. The sales book should be carefully added up, the totals carried forward, and at the end of a given period, usually monthly, the final totals are posted to the credit of the sales account, thus showing at a glance the correct sales of each particular line.

SALES BOOK (ANALYSED FORM)

Date	Sold to	Particulars	Fol.	Corn	Flour	Maize	Total
1958 Oct.	J. Jones	1 Sack Flour 1 " Corn 1 " Maize	66	£ s. d. — 10 0 0 — 10 0 0	£ s. d. — 6 0 0 — 6 0 0	£ s. d. — — 10 0 0 — 10 0 0	£ s. d. — 6 0 0 10 0 0 10 0 0 26 0 0

Purchase Journal (Bought Day Book). In many business houses, purchases form a considerable part of the transactions, and various methods are employed to record them as concisely as possible. If the trader employs a good system, the labour involved in recording them is considerably lessened. It will be found that the purchases on 'credit' are very numerous and invoices will be received of all shapes and sizes, and in order to avoid considerable postings to the 'purchases account,' the 'bought day book,' or, as it is usually called, the 'purchases journal,' is employed; this is on the same principle as the sales day book, and in this all credit purchases are entered, the various purchases extended to their respective columns, and as the persons named in the purchases journal are creditors they will therefore be posted to the credit side of their personal accounts, as with the sales book. The purchases journal is added up at the end of a period and the totals posted to the debit of the purchases account, thus saving a multitude of entries in this account.

Journal. In modern commercial practice the journal proper has almost been done away with, in fact some important business houses employ no journal proper at all. On the Continent, however, the journal is still extensively used, being ruled to contain the whole of a trader's transactions. In France, under the Code Napoleon, its use was made compulsory. It is now used for recording such transactions as opening and closing entries, especially for those that do not come within the scope of other books, such as adjustments, bad debts, interest, etc. The common form of journal is simple; it consists of columns for the date of the entry, particulars, folio, and 2 cash columns for debit and credit; a usual entry would be thus:

Bills of Exchange Act, 1882 (45 and 46 Vict. chap. 61), may be defined as an unconditional order in writing addressed by 1 person to another, signed by the person giving it, requiring the person to whom it is addressed to pay on demand, or at a fixed or determined future time, a certain sum in money to, or to the order of, a specified person, or to bearer. A bill of exchange has many advantages, although some business houses do not adopt bills of exchange, considering them as significant of a state of weak finance. Some of the chief advantages of a bill of exchange are: it is a negotiable instrument, a convenient method for the transfer of debts, and there is prompt legal recovery in the case of non-payment. A firm may be financially embarrassed but have a considerable amount owing in book debts, so they arrange for some of their debtors to accept a bill drawn upon them; they can then obtain financial relief in a number of ways; discount the bill with a banker or bill broker, who will advance the money on it, subject to the deduction of a small discount, or they may transfer it by endorsement to a creditor. As it would be inconvenient to post a bill of exchange direct to the ledger on account of the numerous features of it, e.g. the dates of acceptance and maturity, the names of the acceptor, the bank payable, etc., it is usual to keep a separate record called a bill book, which sets forth in analysed form the date drawn, the drawer, bank payable at, tenor of bill, and due dates, these particulars being required for the due recording of a bill. When a bill has been accepted and received by the 'drawer' it is entered in the bill book, and the 'acceptor' immediately credited, and at the end of a given period the bill book is added up and the total transferred to the debit of the 'bills receivable account,' thus we have the double

JOURNAL

		Dr.		Cr.	
1958		Folio	£ s. d.	£ s. d.	
Oct. 1	Bad Debts Account . . .	66	6 0 0	—	
	To H. Cooper . . .			6 0 0	
	Being amount written off. Debtor having absconded				

Bill Book. It is the custom of many trading concerns to make and receive payments by methods differing from coins, bank-notes, or cheque. 'Bills of exchange,' or 'drafts,' are stamped promises to pay, and according to the

entry. The entries necessary for a bill payable would be vice versa.

Returns Book. In many cases a trader returns goods for various reasons; some may have been damaged in transit, portions may be unsatisfactory and not up

to sample, the wrong goods may have been sent. In the case of 'returns inward' a credit note should be at once made out, stating particulars of the returns and allowance, and should be entered at the same time in the returns book, which follows on lines similar to the sales day book; the item should be posted from there into the customer's account in the ledger; the returns book should be added up at the end of the period, and the totals transferred to the debit of the sales account. *Returns outward* in the majority of cases are entered at the back of the purchases journal posted from there to the creditor's account, and the total of the returns outward posted to the credit of the purchases account.

Ledgers. An impersonal ledger would contain particulars of all property and nominal accounts. Property or real accounts would consist of buildings, plant, and machinery, stock, goodwill, copyright, patents, etc., and in the case of these accounts all property acquired is posted on the debit side of the account, and is always regarded in business as a debtor to the trade for the amount paid in that direction. Sometimes property is parted with; when this is so, the respective property account should be credited. *Nominal accounts* are the subdivisions of the profit and loss accounts, and would be divided under the heading of wages, discount, trade expenses, interest, rent, rates, and taxes, bad debts, depreciation, repairs, etc. When these represent losses they should be debited to their respective accounts; when a gain, such as interest, discount, or rents received, then they should be credited. The *Sales Ledger* contains the record of all the sales to customers. In very large establs. having an extensive turnover it is necessary to have the sales ledger divided into parts or sections, such as *tn.*, country, and foreign, and in some cases these are subdivided, so that 1 ledger may be in 4; then each ledger will contain so many letters of the alphabet, the first ledger having the letters A to G, and the others running consecutively. In the case of a large business it is very desirable that the ledgers should be divided, as this facilitates the discovery of errors, each book being balanced separately, and it also does away with the inconvenience of a cumbrous book. *Bought Ledger* is the facsimile of the sales ledger, but the entries are reversed; all items being posted from the purchases journal and placed on the credit side of the bought ledger. This and the debtors ledger especially should be posted daily.

With the development of the accounting machine the traditional book form of ledger has been replaced by loose-leaf cards for easy insertion into the machines for posting. The entries are made on the ledger card in similar manner to posting by hand, but as the machines have adding and subtracting registers built into them, the new balance is automatically printed by the machines after each entry, thereby obviating the necessity for tedious mental

adding and subtracting. As it is easy to take carbon copies with an accounting machine, a record of every transaction can be made on a sheet of paper passed under the platen of the machine, and the day's postings can rapidly be checked. A further important advantage of the accounting machine is that statements of customers' accounts are prepared and maintained at the same time as postings are made. Among the latest developments of machine accounting are the punched card and electronic systems (*see* AUTOMATON and ELECTRONIC COMPUTATION).

Trial Balance. This may consist of the total postings to the ledger, or the balances appearing at a certain date before the closing entries have been made. The correct method to use when preparing a trial balance is to extract the debit and credit balances and not the total postings, and is generally adopted in business. It exhibits in a concise form the information from which, after the necessary adjustments have been made, a profit and loss account, and balance sheet can be constructed. The total of the debit balances should agree with the total of the credit balances, and if they should not do so it shows at once that an error has occurred either in postings or in the compilation of the trial balance. Even if both sides agree there is still the possibility of compensating errors, e.g. an item of trade expense, which should have been treated as a loss, may have been entered as an asset. A trial balance, therefore, only proves that there is a credit for every debit, but in practice, if the trial balance agrees, it is generally taken that the postings have been correct, and that the accuracy of the books has been proved.

Balance Sheet is a summary in a classified form of the balances remaining in a set of books, kept by double entry, extracted after all the nominal accounts have been closed and all adjusting entries made. It shows the position of a business in relation to its proprietor and other parties, and it is prepared with a view of ascertaining the correct financial status of a trading concern, whether solvent or insolvent. Liabilities are shown on the left-hand side and the assets on the right. As a balance sheet is not an account, but a transcript of ledger balances at a given date, it should never be headed with 'Dr' or 'Cr'; some accountants, however, still occasionally prefix 'To' and 'By', which is incorrect. A simple form of a balance sheet is shown on p. 390.

The Companies Act, 1948, contains statutory provisions regarding the contents of Balance Sheet and Profit and Loss Accounts of Limited Companies.

B. is one of the subjects taught in the majority of the educational institutions in London and the provs. It is possible to obtain tuition at any of the evening class centres held by the London County Council during the winter session on payment of a nominal fee. The pupils are entered for the examinations held by the public examination bodies, at whose

BALANCE SHEET OF WILLIAMS & McDONALD ON 31ST DEC. 1958

<i>Liabilities</i>		<i>Assets</i>	
Capital Accounts:		Freehold Premises	£10,000
R. H. Williams .	£10,000	Plant and Machinery	5,000
P. McDonald .	10,000	Stock on hand .	4,000
		Sundry Debtors .	8,000
		Cash at Bank .	1,000
Sundry Creditors:			
On open accounts	£4,000		
On Loan .	2,000		
Balance, Profit			
	6,000		
	2,000		
	£28,000		£28,000

examinations anyone may sit on payment of a small fee. The prin. London bodies are the London Chamber of Commerce; the Society of Arts; the National Union of Teachers; the Association of B. Teachers, etc. In addition to the above are the special professional societies for whose examinations only those who are specially qualified or articulated are permitted to sit. Text-books recommended for use: H. J. Clack, *Advanced Book-keeping: for the Advanced Student*, 1932; A. J. Favell, *Practical Book-keeping and Accounts* (two parts), 1934-5; G. O. Sutherland and W. Padgett, *The Groundwork of Book-keeping*, 1936; E. E. Spicer and E. C. Pegler, *Book-keeping and Accounts* (tenth ed.), 1938; D. Cousins, *Book-keeping and Accounts*, 1945; H. Brown, *Municipal Book-keeping and Accounts*, 1946. See also AUTOMATON and CALCULATING MACHINES.

Book-land, see BOOK-LAND.

Book League, National, see NATIONAL BOOK LEAGUE.

Book-lice, insects of the family Psocidae and order Psocoptera, which destroy the bindings of books; the peculiar tapping noise they make has earned for them the title of *death-walches*. *Atropos* and *Clothilla* are genera which include mischievous B.

Book of the Dead, see DEAD, BOOK OF THE.

Book-publishing, see PUBLISHING.

Book - scorpion (*Chelifer cancelloides*), arachnid of the order Pseudoscorpiones and family Cheliferidae. They are brownish in colour, have 2 eyes, and probably live on book-lice (q.v.).

Book-worm, name given to any larvae which feed on the paper, binding, and paste of books which are not often used, or are stored in museums. They may merely attack the binding, or may bore tunnels through the pages. Sev. species of *Anobium*, *Anthrenus*, *Ptinus*, and *Dermestes* are coleopterous insects of destructive nature which damage books. In America the *Phyllodromia* (or *Blatta*) *germanica*, a cockroach known as the Croton bug, performs the function of a B., though it is naturally not considered as one. Frequent overhauling of books is the best preventive of such pests.

Bookmaking, see BETTING.

Bookplate, or Booklabel, engraved or printed form establishing ownership, to paste inside the front cover of a book, and showing the name, monogram or coat of

arms of the owner of the book. Sometimes called *Ex Libris*, or 'From among the books of . . .'. From the 15th cent. wood-cut or engraved Bs. were popular, and often beautifully executed by well-known artists, such as Dürer and Bewick. In recent times ornate and armorial designs have given way to typographical or lettered B.s, such as those designed by Reynolds Stone. A large collection of B.s (The Franks Collection) is to be seen at the Brit. Museum, and another at the Fitzwilliam Museum in Cambridge. See W. J. Hardy, *Bookplates*, 1897; G. Howe, *Catalogue of British and American Bookplates in the British Museum*, 1904; G. H. Viner, *The Origin and Evolution of the Bookplate*, 1940; M. F. Severin, *Making a Bookplate*, 1949.

Booksellers Association of Great Britain and Ireland, formed in 1895, having as its main object the development of a stable retail side to the book trade by means of a price-maintenance system. In pursuance of this it vigorously supported the Net Book Agreement put forward by the publisher Mr (afterwards Sir) Frederick Macmillan. As well as protecting the interests of its members the B. A. has set out to improve and maintain the status of the trade, and has done much towards this by its efforts in promoting staff training and education schemes. The B. A. is organised regionally into 16 branches, each of which sends a representative to the national council. Specialist groups dealing with particular classes of book-selling have also been set up. An ann. conference and special sessions are held in which publishers are invited to take part, thus providing the Brit. book trade with an unofficial 'parliament.'

Bookselling as a trade has its recorded origins in classical times, and anc. literature contains many references to the booksellers (*bibliopolae* or *librarii*) of Athens and Rome, whose stock was the scrolls (vols.) produced by educ. slaves. B. was carried on in Athens from the 5th cent. B.C.; later Alexandria became the centre of the book trade and then Rome, where the booksellers were numerous and prosperous. The pillars outside the shops and the sides of the doors and windows were covered with the titles of books on sale within. There among the wealthy a collection of books was regarded as an essential part of a man's possessions. Horace complained that his booksellers (the Sosti brothers) made more out of his

books than he did. Titus Pomponius Atticus, Cicero's friend and publisher, was the first great bookseller. He had branches of his business in Rome and in the provs. The 4th cent. A.D. sees the end of references to B. (as a trade it would hardly have existed in the Dark Ages), but in the 12th cent. according to Hallam's *Literature of Europe*, shops were set up in Bologna and Paris, chiefly to serve the univs. In the 14th cent. Paris was the world's book market, the booksellers functioning under univ. regulations; in fact, the development of univs. and the growth of B. went hand in hand. Cambridge booksellers were first referred to in 1276. John Hardy, bookseller of Cambridge, is recorded in 1350 and stationer Robert of Oxford in 1308. In medieval times booksellers were called stationers owing to their transacting business from stalls or shops (*Low Lat. statio*). This distinguished them from the pedlars who in pre-Reformation times, and later, were lively channels of book distribution. Booksellers also sold parchment and paper, and thus it is that in modern times the term stationer has shifted its meaning. The Booksellers' Guild, incorporated as the Stationers' Co. in 1557, has 600 years of hist. This company in the 16th cent. had wide powers enabling it to suppress works obnoxious to authority. The sale of gospels and devotional books was long the monopoly of guilds or of univ. stationers, and later in the 16th cent. of the king's printer. There was at that time no free press in England, though books could be bought freely on the continent of Europe; Laud in the 17th cent. was notorious for the restrictions he introduced, but these were abolished during the Commonwealth.

Just as in its time the rise of Christianity produced a widespread demand for copies of the gospels and of missals which were issued as codices (i.e. books, as distinct from scrolls), so did the invention of printing, the new learning, and the Reformation influence decisively the demand for books and help to shape the trade of B. as we know it to-day. Gutenberg and his successors laid the foundations of the trade. In his time, as in classical times, the producer was the distributor, the publisher was the bookseller, and for two or more cents. the bookseller was printer and bookseller combined (e.g. Christopher Plantin (1514-89) of Antwerp, whose printing office and bookshop is preserved as the Plantin Museum). An English counterpart was Edward Blount (admitted to the Stationers' Co., 1588; *d.* 1632) who, with Wm Jaggard, bookseller, and printer to the city of London, pub. the First Folio of Shakespeare. Jacob Tonson (1656-1736) was one of the great booksellers of his day. He pub. for Dryden, did very well out of *Paradise Lost*, and by publishing Rowe's ed. of Shakespeare rendered him for the first time generally accessible. Another was Thomas Guy (1644-1734), notable as much for his B. as for his benefactions. The 18th cent. has been called the golden age of B., and Robert Dodsley (1703-64)

is one of the great names of the cent. He pub. much for Samuel Johnson and suggested and helped to finance the *Dictionary*. James Lackington (1746-1815) was the first bookseller to conduct business on a strictly cash basis and the first to deal in remainders. In those days there was no royalty system, the author being paid a lump sum for his work—and often, as the records of 'Grub Street' show, a very small sum. Another evil of those days was the patronage system, by which a struggling writer had his work printed through the favour of some nobleman or other wealthy person, a system in which booksellers had a part; and a variant of that was the subscription system, by which wealthy or learned persons subscribed for copies of a work before pub., and which pertains to-day only in the case of books privately printed (though in the trade all orders for a book before the actual date of pub. are still called subscription orders).

The beginning of the 19th cent. saw the end of the publisher-bookseller, and thereafter the two functioned separately, so that to-day publishing is a clearly defined profession and B. as clearly recognisable as a trade. The cent. saw certain developments in the trade, notably the rise of the circulating libraries, the most famous being Mudie's, and the estab. of the railway bookstall, from which in the next cent. developed the multiple book shop. It was a hard but interesting cent. for the bookseller, with its development of the technique of printing cheaply and the gradual increase in literacy, which encouraged the opening of bookshops all over the country. But the trade was not organised. Towards the end of the cent., with increasing competition came the discount system, in which booksellers sold at varying but considerable discounts off pub. prices. It was cut-throat competition and it brought ruin to many booksellers. So disastrous had the position become in the last decade of the cent. that the publishers saw their businesses in danger unless some action was taken. Frederick Macmillan, with his friends Murray and Longman, devised the net book system, described as the sheet-anchor of the trade, which was introduced in 1899 and was generally adopted by 1906. This ensured that any book pub. at a net price should be sold at that price. For 60 years this agreement has been honoured by the trade, and what measure of prosperity the bookseller now enjoys is due substantially to this agreement, which was operated by the Publishers' Association, who had the power, only rarely used, to black-list persistent offenders. The passage into law of the Restrictive Practices Act in 1956 was seen as a grave danger, but the general acceptance by the publishers of the new Net Book Agreement, 1957, made it plain that they were determined to maintain the fixed price principle; in fact, the new agreement made the net book system a more closely knit instrument than heretofore; what previously could only be regulated by action within the trade had

now become a contract enforceable through the courts of law.

In 1895 the booksellers formed themselves into an association (now called the Booksellers' Association (B.A.) (q.v.)), set up, as was the Publishers' Association formed a year later, to provide a body to deal corporately with problems connected with the implementation of the Net Book Agreement. Membership of the B.A. is not obligatory on booksellers: of the 7000 persons or concerns now registered with the publishing body as eligible to receive trade discounts, some 2700 only are members of their own trade organisation. This number includes all booksellers of note. Advantages of membership include the sale and exchange of book tokens, introduced to a hesitant trade in 1926 and now an accepted and valuable part of B., participation in the Booksellers' Clearing House, by which some hundred or so accounts may be paid by one cheque, and various sales promotion schemes, formulated from time to time, the most striking being the national books sales of 1955 and 1956.

The year 1955 saw the final collapse of the great wholesalers, Simpkin Marshall, who had never properly established themselves after the total destruction of their stock and premises in 1940, a loss the magnitude of which both sides of the trade were quick to experience. For both it meant enormous additional labour in the servicing of orders for single copies of a title. Late in 1955 an 'Orders Clearing' service was instituted as a first step towards the eventual setting up of a jointly controlled 'Single Copy House,' a centre for the collection and dispatch of these items of trade which represent as much good service as profit. Notable in the hist. of the trade in the period between the wars was the introduction in 1926 of book clubs (q.v.); and their growth and successful exploitation during a quarter of a cent. has resulted in a current ann. distribution of some 9½ million vols., fewer than half of which pass through the booksellers' hands, however. Even more revolutionary in shaping reading habits have been Penguin Books, started in 1936, which by high standards of production and text broke down the old prejudice against paper-backed books, led the way for other first-rate series, and widened the market for books to an astonishing degree. The paper-back has become a national institution, and well-designed shops for the sale only of such literature are beginning to be opened up.

The increase of the reading habit among children has resulted in craft of a high order both in authorship and in production being devoted to juvenile literature, and the ann. Carnegie Medal, for a work of outstanding excellence in this field, has been awarded by the Library Association yearly since 1937. In 1940 the book trade, under the wise and vigorous leadership of Sir Geoffrey Faber, fought a new 'battle of the books,' and successfully resisted the imposition of a purchase tax on books. Recent hist. of the trade is remarkable for the degree of

co-operation achieved between publisher and bookseller, to an extent impossible to have foreseen earlier in the cent. The founding of the National Book Council (now the National Book League, q.v.) in 1925, and the establishing in 1929 of the Joint Advisory Committee of publishers and booksellers, marked practical steps on the path to fuller collaboration.

In 1948 the booksellers, aware that the trade was less prosperous than was safe for its healthy functioning, were instrumental in setting up a joint book trade committee, which after four years of close discussion produced a valuable report on sales expansion, methods of distribution and rationalisation of terms, and trade practice. In 1953 came the Chalmers Trade report, an examination of the trading figures over the previous four years of a number of representative booksellers, which dramatically spotlighted the narrowing margins of profit in B., due to irresistible increases in overheads (rent and wages).

It is a reflection on the trade that the economics of retailing are such that even given the stabilising effect of fixed prices, it is not possible to make a living by the sale of new books except in a very few special cases, e.g. in central London or in some univ. cities. The bookseller is forced to add other commodities or services to his stock-in-trade, which may include second-hand books and probably a lending library; stationery in all its ramifications is the most usual and obvious addition, but reproductions of works of art and gramophone records are increasingly being thought of as appropriate stock. The reasons for this condition of things are various and complex, but they may be summed up as being due primarily to lack of turnover, i.e. not enough books being bought by the public, and secondly to insufficient profit margins: it is more costly to sell books than most other commodities owing to slow turnover, degree of service required, and rapid depreciation of stock.

Anyone may set up as a bookseller in this country. No qualifications are needed; all that is required in an official sense is that he should be registered by the Publishers' Association as eligible for trade terms. He need know nothing of books or of the trade. In fact, to succeed he will require to possess varied and diverse qualities, for B. at its best calls for wide general knowledge, a retentive memory, a natural faculty for liking people, a love of literature, and, most important, sound business instincts. His stock he will build up with the utmost care: buying is the key job in any bookshop and calls for judgment of a fine sort. He will have to trim his purchases to the particular needs, found by trial and error over long years, of his locality and trade. He will be expected to maintain a basic stock of classic literature, and representative titles from all the popular and leading series, and though he may regard himself as a general bookseller, he will probably find it convenient and profitable to specialise in a congenial range of subjects. New books are bought largely in advance of

pub. from publishers' travellers; such orders usually carrying a better discount than orders sent in after pub. To the travellers are given orders for replacement of level stock, that is, titles reckoned normally to be kept on the shelves. The need to secure best discounts requires an exact knowledge of publishers' terms, which though possessing a superficial uniformity do vary remarkably from publisher to publisher or from category to category of title. Some are more generous, others less so: it will depend also on whether the order is for general literature, or for technical or educational works, or which discounts are restricted. His daily orders, usually for single copies of books, on the speedy supply of which his reputation for good service will largely depend, will require all his attention, for without a comprehensive wholesale service he has to decide on the quickest and the most profitable way to get these daily orders to his shop. The bookseller will pay attention to talks on books on the radio and television; he will keep abreast of book reviews in the leading literary journals, so that he is prepared for inquiries. If he is wise he will have secured some institutional business (i.e. book orders from schools, technical colleges, public libraries, etc.). This business is regular, and though it is usually conducted at a discount is good bread-and-butter trade. He has to do something more than wait for orders: he must exercise a creative salesmanship, if he is to make a mark in his community. He cannot hope to stock more than a fraction of the 18,000 new books pub. every year; but by having available the best reference catalogues, he can at least know something of them, and that is half the battle in securing an order. Particular attention will have to be paid to new developments in his locality, as, for example, factory building and its potential market for technical literature. There is in this country virtually no system of sale or return, except in the case of particular books requiring special display. All the books on the shelves of a bookshop, therefore, have been paid for: they are the booksellers' capital, and on his skill in selling them depends his solvency. As important as good stock is good staff, who should be lively, knowledgeable, and courteous. Their wages are now subject to the rulings of the official wages board, and their trade education can be helped by the courses arranged by the Education Board of the B.A. B. is a trade of many attractions: it appeals increasingly to women of education and character, and it can make a very satisfying means of livelihood.

Second-hand or antiquarian B. is widely practised in this country: a good second-hand department is a useful, if not a necessary adjunct to any well-run bookshop. But it is a different sort of business, calling for different techniques, involving attendance at sales and issue of catalogues. It is in the main a highly specialised trade, requiring technical knowledge in limited fields. Many anti-

quarian businesses are one-man concerns, but that one man is an expert, possibly a scholar in his own territory. Not only is he making a living but he is also serving the learned world by his specialisation. The second-hand trade has its own organisation, the Antiquarian Booksellers' Association.

The practice of B. in Great Britain as outlined here applies in general to most overseas countries, though the tendency, on the continent of Europe at all events, is for a greater cohesion between trade organisations, a more rigid control, exercised through the publishing side, resulting in greater efficiency, and a markedly superior distributive system. In the countries of the British Commonwealth there is greater flexibility of discounts between publisher and bookseller, to offset heightened stock risks due to transit difficulties, though many Brit. publishers now maintain stock either themselves, or in the hands of agents, in Australia, Canada, New Zealand, South Africa, India, and Pakistan. B. in the U.S.A. differs considerably from the system in this country. Except in the largest or univ. cities, where admirable book-stores are found, the traditional bookshop scarcely exists. There the overall picture is dominated by the paperback, which finds its market through the ubiquitous drugstore and the like, and by the book club, through which millions of vols. yearly reach their subscribers by post. On the other hand, the antiquarian trade is well conducted on traditional lines.

See also BOOK; BOOK CLUBS; BOOK-COLLECTING; COPYRIGHT; LIBRARIES; PUBLISHING.

See J. Britnell, *Books and Booksellers in Ancient and Modern Times*, 1923; J. G. Wilson, *The Business of Bookselling*, 1930 (2nd ed., 1945); F. A. Mumby, *Publishing and Bookselling*, 1930 (4th revision, 1956); H. W. Boynton, *Annals of American Bookselling*, 1932; J. Hampden, *The Book World*, 1935 (re-written, 1957); Marjorie Plant, *The English Book Trade*, 1939; J. S. Bain, *A Bookseller Looks Back*, 1940; W. G. Corp, *Fifty Years*, 1948; B. N. Langdon Davies, *The Practice of Bookselling*, 1951; Thomas A. Joy, *Bookselling*, 1953.

Boole, George (1815-64), mathematician and logician, b. Lincoln. He entered the scholastic profession when only 16, and later started a school of his own in Lincoln. In 1849 he was appointed prof. of mathematics at Queen's College, Cork, and had already shown his mathematical ability by his 'Theory of Analytical Transformations' pub. in the *Cambridge Mathematical Journal*; to it he contributed many other papers and also to its successor, the *Cambridge and Dublin Mathematical Journal*, and to the *Philosophical Magazine and Philosophical Transactions*. He is best known by his *Treatise on Differential Equations*, 1859, later revised by Todhunter to become a standard text-book, and by a *Treatise on the Calculus of Finite Differences*, 1860. B.'s writings on logic are even more

original than those on mathematics. See his *Mathematical Analysis of Logic*, 1847, and *An Investigation of the Laws of Thought, on which are founded the Mathematical Theories of Logic and Probabilities*, 1854.

Boom, industrial tn of Belgium, 12 m. S. of the city of Antwerp. There are brick and tile works, breweries, salt and starch manufs. Pop. 18,400.

Boom: 1. Nautical term (allied to 'beam,' from Dutch *boom*) for the spars which are attached to the mast at one end, and controlled by the sheet at the other end, extending along the foot of the sails. According to which sail it is connected with, it is termed the jib-boom, the main-boom, etc. The term was also used for a barrier of timber, etc., which was fastened across the mouth of a harbour in war to prevent the entrance of the enemy's vessels, as the famous B. in the siege of Londonderry in 1689. In modern warships it is a spar placed at right-angles to the hull, to which small boats are made fast, used only when the vessel is at anchor or secured to a buoy. It is referred to as the lower B.



British Museum

RETURN BOOM-
ERANG USED IN
HUNTING
NW. Australia.

2. Commercial term, originating in the U.S.A., having come into use during the latter half of the 19th cent. To 'boom' (M.E. *bummen*) means 'to make a deep continued sound,' and as a sudden movement often produces an increasing sound B. has come to mean a sudden spurt of activity in the business world.

Boomer, Australian name of the male of the largest species of kangaroo.

Boomerang, missile made of wood, used by the aborigines of Australia and of some other places. There are 2 kinds of B., which must be carefully distinguished, the return B. and the non-return B. The origin of the term is not definitely known, but it seems to have been the word used by the aborigines of New S. Wales for the weapons which they themselves used. The B. is made of hard wood and in Australia is always curved at an angle of between 90° and 120°. It is 2-3 ft long and weighs roughly half a pound. The non-return B. is much longer, and from Central Australia come huge specimens, 6 ft long. One side of it is flat, the other convex, and along the convex side runs a sharp edge. The arms have a skew upon which the return or non-return of the B. depends. The B., when about to be thrown, is held vertically, and when thrown as much rotation as possible

should be imparted to it. After travelling 50 or more yds revolving in an upright direction, it turns over on the flat side, curves away to the left, and begins to rise in the air, before it finally returns to the thrower and drops. An Australian will often make it describe 3 or 4 circles, rising 150 ft, before it returns to him, and it has been known to return to the thrower even after striking the ground. The war B. is of the non-return type and is thrown under the shield in a stooping position. It is sometimes made to strike the ground some 20 yds ahead of the thrower, and then flies 80 yds or so farther at a height of 4 ft.

Boomplaats, tn of S. Africa in the Cape Prov. It is the site of a battle fought in 1848, when the British under Sir Harry Smith defeated the Boers under Andries Pretorius, who had relied upon help which did not materialise.

Boonder, see RHESUS MONKEY.

Boone, Daniel (1734-1820), Amer. backwoodsman and pioneer, b. Pennsylvania, of Eng. descent. His early life was spent on his father's farm. In 1767 he visited the dist. of Kentucky, which, however, he was not the first to discover. Later in sev. campaigns he explored more thoroughly the ter. of Kentucky, meeting with many adventures. In 1775 he led the party of settlers who founded the tn of Boonesboro, or Boonesborough in Kentucky. Later, during one of his expeditions, he was captured by Shawnee Indians, adopted into the tribe, and only managed to escape with considerable difficulty. For a short time he sat in the Virginia legislature as the representative of Kentucky. He lost all his land in Kentucky owing to his want of formal titles, and retired later to Missouri, where in 1803, when this ter. came into the possession of the U.S.A., he again lost his land for the same reason. In 1812 he was granted some land as a recognition of his services. Many biographies of him have been written, one of the best being that by John Bakeless, *Master of the Wilderness: Daniel Boone*, 1939.

Boorde, or **Borde**, Andrew (c. 1490-1549), physician and author, was educ. at Oxford. He joined the Carthusians while still a minor, and was made suffragan Bishop of Chichester, in 1521. He was freed from his monastic vows in 1529, and then studied medicine, afterwards travelling on the Continent. He was, after he had returned to London in 1534, sent on a mission by Thomas Cromwell to discover the state of feeling which prevailed abroad towards the Eng. king. In 1536-8 he travelled widely through nearly every European country, but his account of his travels, sent to Cromwell, was lost. Wrote *Fyrst Boke of the Introduction of Knowledge* (the earliest continental travel guide), 1548, *Dietary of Healthe*, 1562, and *Breviary of Helthe*, 1547.

Boos, Martin (1762-1825), Ger. priest, b. Bavaria. In 1790 he originated a religious movement parallel to that of the Protestant Pietists. He was created prof. of theology at Düsseldorf in 1810, and held the post till 1819.

Booster, dynamo worked as an auxiliary to a larger one for the purpose of charging, or adjusting the charge of, accumulators. It is usually arranged that when the load on the supply dynamo is greatest, the B.s help the accumulators to discharge, but when the load is less, the B.s recharge the accumulators.

Boot, see **BOOTS AND SHOES**.

Boot, Boots, or Bootikin, instrument of torture used in order to extract confession from suspects. It seems to have been first introduced in Scotland, where its use appears to have continued down to the union of the 2 kingdoms in 1707, when it was enacted that torture should not be used again in Scotland. Torture appears to have been last used in England about the year 1640. It comprised a long iron or wooden B. into which the foot of the victim was inserted, wooden wedges being afterwards inserted, usually between the B. and the calf, and driven in forcibly with a wooden mallet. Between the blows questions were put to the sufferer until he either confessed or was mercifully released by unconsciousness. At the same time that this instrument of torture flourished in Scotland, a similar instrument was used in Germany called the 'Spanish B.' Other varieties of the instrument seem to have been metal B.s which were placed on the victim and then excessively heated, and B.s made wet and then placed on the victim's foot and allowed to contract as they dried.

Boötēs, constellation next in the heavens to the Great Bear. If the latter constellation be regarded—as it is sometimes called—a Plough, or a Wagon, B. may be regarded as representing its driver. B. was, in fact, termed by the Greeks *Arctophylax*, the 'bear-keeper.' Alpha Boötis, or Arcturus (q.v.), is the brightest star in the N. hemisphere and Epsilon Boötis is a beautiful double of yellow and blue.

Booth, Barton (1681-1730), actor in the reigns of Anne and George I., joined a company of strolling players in his youth. He had considerable talent, and was received in Dublin with great applause. In 1701 he came to London and joined the Drury Lane company. His most famous part was that of Cato in Addison's play of that name. He was buried in Westminster Abbey. His life was written by Theophilus Cibber.

Booth, Charles (1840-1916), sociologist, b. Liverpool. He was a member of the shipping firm of Alfred Booth & Co., Liverpool, and a fellow of the Royal Society. He made inquiries into the statistics affecting various social questions, and in his book, *Life and Labour of the People in London*, 1891-1903, he deals with these statistics, and discusses the condition of the different classes. He did a great deal towards securing old age pensions, and on this subject he wrote the following books: *Pauperism, a Picture, and Endowment of Old Age, an Argument*, 1892, and *Old Age Pensions and the Aged Poor*, 1899. He was a privy councillor, and won a high place among sociologists of the day. President of the Royal

Statistical Society, 1892-4. See memoir by M. Booth, 1918.

Booth, Edwin Thomas (1833-93), Amer. actor, b. Belair, Maryland, the second son of Junius Brutus B. (q.v.). He made sev. appearances on the stage previous to his father's death, but was not held to have been a very great success. After the death of his father (1852), he toured California and Australia, and met with overwhelming success. On his return from his tour, he played at the Winter Gardens in New York (1862), producing Shakespearian plays on a magnificent scale. During the period which followed the assassination of President Lincoln by his brother, John Wilkes B., his career was overshadowed by that event (1865). In 1868 he built a theatre of his own in New York, but eventually lost all his fortune in it. He produced here a number of Shakespear's plays, and by great labour was able to retrieve his fortunes. He founded the Players' Club in New York, and converted his own private residence into a club house. He was a first-rate actor, particularly in tragic parts, and was asked by Irving to play in London the roles of Othello and Iago alternately with himself. His last appearance was as Hamlet in 1891 in Brooklyn. Life by E. B. Grossman, 1894.

Booth, Evangeline Cory (1865-1950), 'General' of the Salvation Army, (q.v.) b. Cambridge Heath, Hackney, seventh child of Wm B., founder of that body. She was leader of the Salvation Army successively in Great Britain, Canada, Newfoundland, and the U.S.A., and succeeded Edward J. Higgins as general in 1934. She d. at New York. She composed sev. songs, including 'Songs of the Evangel', 1927. Other publs.: *Towards a Better World* (sermons), 1929, and *Woman*, 1930.

Booth, John Wilkes (1838-65), Amer. actor, son of Junius Brutus B. (q.v.) and younger brother of Edwin Thomas B. (q.v.). In 1865, disappointed by his ill success as an actor, he entered into a conspiracy which had as its object the assassination of Abraham Lincoln, as a revenge for the ill success of the Confederates. On 14 April, while Lincoln was watching a play from a box at Ford's Theatre, Washington, B. shot the president and managed to escape, although he had broken his leg. He was, however, ultimately tracked to Virginia, where, since he refused to surrender, he was shot.

Booth, Junius Brutus (1796-1852), actor, b. London. Father of Edwin Thomas B. (q.v.) and John Wilkes B. (q.v.). He received a fair education, and, after trying a number of professions, he appeared at the age of 17 in some unimportant parts. Two years later he appeared at Covent Garden, and from this time was considered one of the best actors of the age, and Kean's greatest rival. In 1821 he migrated to the U.S.A. and became famous there.

Booth, William (1829-1912), better known as Gen. B., was b. Nottingham. At an early age he came under strong religious influences and, after having been

a local preacher with the Wesleyan Methodists and a minister of the Methodist New Connexion, he severed his connection with those bodies and engaged in evangelistic work. His work was done amongst the poorest and the most degraded people, and he organised them into bands who openly testified to their conversion. He organised successively a number of missions, the most successful of which was the Salvation Army (q.v.) in 1878.

Booth, William Bramwell (1856-1929), eldest son of Wm. B., founder and first 'General' of the Salvation Army, b. Halifax. Educ. privately, he began public work in 1874. Chief of Salvation Army staff from 1880; chairman of Salvation Army Life Assurance Society and the Reliance Bank. He was ably assisted by his wife Florence whom he married in 1882, and by whom he had 2 sons and 5 daughters. All the family joined enthusiastically in carrying on the work started by his father for the relief of the 'submerged tenth.' On his father's death, B. succeeded him as general of the Army, and it was largely owing to his organising ability that the movement's missionary and social activities were estab. and extended. He was a virile opponent of social evils. In 1883 he joined with W. T. Stead in attacking the 'white slave' traffic which resulted in the passing in 1885 of the Criminal Law Amendment Act. Among his pubs. are *Social Reparation*, 1899, *Bible Battle-Axes*, 1901, *Papers on Life and Religion*, 1920, and *These Fifty Years*, 1929.

Booth (from a Scandinavian root, seen also in Icelandic *búa*, to dwell, and Dan. *bod*) is a covered stall at a fair or market, set up for the purpose of displaying goods for sale. At first a B. was a temporary structure, taken down each week after market-day, but there was always a tendency for the B. to become permanent. Records, dating as far back as the 12th cent., have preserved many complaints lodged against encroachments on the market-place. Thus in 1192 the abbey of Bury St Edmunds made a fruitless attempt to remove the sheds which citizens had dared to set up without the abbot's consent. That tendency towards permanence is well illustrated by the 'Lucken-B.s.' that grew up in Edinburgh High Street. A burgher became so attached to his own little niche beneath the tn hall, that the timber planks of his movable stall were gradually replaced by lath and plaster, and even by brick and stone. These unsightly 'kramers' or B.s., fastened to the basement of public buildings, have been aptly compared to limpets on a rock. The shopman stood within the unglazed window, the shutter of which divided horizontally in the middle, so that the upper part formed an eaves or awning, and the lower portion a shelf for his wares.

Bootham School, public school for boys, founded at York in 1823 for sons of members of the Society of Friends. Boys of any denomination are now accepted.

Boothby, Guy Newell (1867-1905),

Australian novelist, b. Adelaide. His grandfather was a Yorkshireman, who emigrated to Australia in 1853. B. finally left Australia for England in 1894, and, settling at Bournemouth, estab. a reputation as a novelist of the popular type. His novels include *A Bid for Fortune*, or *Dr Nikola's Vendetta*, 1895, *The Beautiful White Devil*, 1896, *The Fascination of the King*, 1897, and *Dr Nikola's Experiment*, 1899.

Boothia, Gulf of, sea passage forming the N. boundary of Boothia Felix. It is an extension of Prince Regent Inlet, and is about 310 m. long.

Boothia Felix, peninsula situated on the N. coast of Canada. It belongs to the Franklin dist., and its area is about 13,100 sq. m. It was discovered by Capt. Ross, 1829-33, and named after Sir Felix Booth, who financed the expedition to the extent of £17,000.

Booth, co. bor. of Lanes, England, situated at the mouth of the R. Mersey, immediately N. of Liverpool. It is noted for its immense riverside docks. It has large engineering and tin smelting works, tanneries, corn mills, etc. There are 2 railway stations on the main Liverpool-Southport line, and 3 on the Liverpool Overhead Electric Railway. B. is a fine tn, containing many large public buildings. There are libraries, museum and art gallery, tn hall and municipal offices, and sev. parks and recreation grounds. The parl. bor. returns 1 member. The tn suffered severely during Ger. air-raids on Merseyside in 1940-1. Pop. 75,000.

Bootlegging, term applied to the smuggling of illicit liquor. It is an old name which goes back to days when the liquor was concealed in the large sea-boot of the smuggler, and was revived in the 20th cent. in connection with the smuggling of alcohol into the U.S.A. at the time of prohibition (q.v.). In the early days of prohibition B. was a large industrial organization with a network of traffic over the Canadian and Mexican borders of the U.S.A., but this trade was later stopped by the vigilance of Federal prohibition agents. Modern B. approximated more to old-time smuggling in the attempts that were made to land liquor on the Pacific and Atlantic coasts of America. On the Atlantic side the consignments of alcohol were shipped from the distilleries of Scotland to the 'rum row,' as it was called, off New Jersey. Brit. Bahamas, and the is. of St Pierre, off Newfoundland, were used as half-way houses, and from them means were found to transport the liquor to the Amer. coast. Liquor importations into Nassau, Brit. Bahamas, increased so phenomenally that gov. revenue from a tax of \$7 a case went up by leaps and bounds. Another method of B. was for the 'rum-fleet' to wait out at sea beyond the reach of revenue cutters, Amer. waters being fixed at a 12-m. limit. The liquor was then conveyed to the coast at night by fast motor-boats. The B. industry, however, suffered from its degeneracy, for so many poisonous concoctions were peddled under faked labels that neither the bootlegger nor his customer could

be certain of the genuineness of a bootlegged brand. A serious aspect of B. was that it afforded equal opportunities for the importation of drugs and narcotics. The bootlegger depended upon a business organization, linking him up with the smuggler or the 'moonshiner,' the latter being the man who owned a secret still, but he had another enemy beside the prohibition agent, and that was the 'hijacker.' The hijacker preyed upon the bootlegger and, playing a lone hand, constituted the most dangerous element in the whole lawless trade of B.

Boots and Shoes. Many and various have been the different forms of covering for the human foot, and many stages of evolution have been passed through from the primitive sandal to the latest products of the shoe factories. Not only fashions but climatic conditions, have always been factors in the form of foot-gear. The most elementary form of covering is the sandal; the next is the slipper, in which the straps or lacing of the sandal are discarded; from the slipper the ordinary short shoe is evolved, and from the latter the boot. As it is the most primitive, so naturally is the sandal the most ancient form of foot-covering. In many museums specimens can be seen of sandals dating back to the time of the Egyptians; papyrus was a common material for sandals of that period. Long boots were worn by hunters, and the *cothurnus*, or boot with a very thick sole, was used by tragedians on the stage. In Rome there were more varieties: *soleae*, or sandals, were used by the plebs or common people; *calcei*, or black leather shoes, were worn by members of the patrician class; *mullei*, or red leather shoes, were reserved for the use of senators. From early times up to the present day, the oriental peoples excelled in the art of making beautifully ornamented slippers. In medieval times shoes were worn on the continent of Europe, and by the end of the 14th cent. the fashion of pointed toes had been carried to such a length that the toes of many shoes of that period project for over a foot, in a long curled-up strip of leather. By the time of Edward IV the boot proper was *de rigueur* as an article of knightly attire, and continued so until the more ornamented Fr. boot was introduced by Charles II. William III and his followers estab. the use of the jack-boot for horsemen, and it was used by the Brit. cavalry until quite recently. A somewhat less cumbersome form is used by the Household Cavalry. The jack-boot was superseded in general use by the Hessian boot, which was more slightly over the tight pantaloons in vogue than the former. For use under loose pantaloons the Duke of Wellington introduced the boot which bears his name. After the Wellington the Blücher boot was used, and now the form of boot generally worn is short, just covering the ankles.

Boot and shoe manufacture. Until the advent of machinery, all boots were made by hand; but shoe making as a handicraft is dying out, and machinery may be used for all the processes. The machine-made

products do not equal the best of those made by hand in flexibility or endurance; but a more even standard is attained and the output attained by machinery is of course much greater. The Blake machine for sewing the soles together marked the first step in the transition from hand to machine-made goods, and the machinery later invented for welting the shoe rendered the best of the latter practically on a par with the best of the former. The Blake process which was extensively used in ladies' shoes has now become almost



British United Shoe Machinery Co. Ltd

CROSS-SECTION OF A WELTED SHOE

A. Insole. B. Inseam. C. Welt. D. Sole Seam. E. Sole. F. Bottom filling.

obsolete and has been replaced by a process in which the sole is attached to the shoe by means of an adhesive. The difference between the riveted shoe, made by the Blake process, and a welted shoe is briefly as follows. A Blake or riveted shoe is sewn, or riveted, from sole to insole, at one operation; the upper is at the same time fastened between the 2 soles. This vertical seam, even if sewn, has a tendency to stiffen the shoe unless the leather used is exceedingly light and flexible. If the shoe is riveted it is still stiffer, and therefore this style of shoe is used only for rougher wear. When a shoe is welted, whether by machine or hand, the upper, insole, and welt are first sewn together with a horizontal seam, extending half through the insole; the welt and sole are then joined by a second operation. The defect of the Blake and riveted shoes is by this means eliminated, as the shoe bends inwards

along the horizontal seam, and is much more pliable. In almost all modern factories human labour is dispensed with as much as possible; in shaping the uppers it is used more than in the rest of the processes. The uppers of footwear are made from the skins of the lighter animals—mainly calf, goat, and sheep, whilst the soles are made from the butt portion of heavier hides—such as oxhides. The shoulders of these animals are also used for very light, flexible soles for slippers and

the sewing-machine, and after they have been stitched together the seams are levelled down by a 'seam rubbing' machine. The thicker leathers used in the bottom parts are cut from the hide, after being pressed under powerful presses, with dies shaped according to the various parts required. The layers of leather required for the heel are first of all nailed together loosely in one machine, and then crushed solid in another, which exerts on them a pressure of sev. tons. All the various parts of the boot are now sent to the assembling room, preparatory to being started through the making and finishing rooms. The shoes which are to be made 'stuck-on' or 'cemented' (the modern development from the original Blake sewn shoes) receive slightly different treatment from those that are to be welted. The last is iron on the bottom, and so the lasting machine permanently tacks the upper to the insole with short tacks, which are clenched when coming into contact with the last. An alternative method of lasting is to lay the upper edge over the insole and to stick it down with an adhesive. In the welted shoe the upper is not nailed down to the insole, but is held by a lip previously cut in the latter, standing out therefrom vertically. The lip, the upper, and the welt are all 3 sewn together by a machine whilst the shoe is still on the last. The welt is now beaten out straight, and the sole laid on and held in position by paste, etc., until it is stitched. From this point the treatment of 'stuck-on' and welted shoes is similar, save that the former generally have the nails driven from the inside through to the heel, while the latter have the nails driven through the heel to the sole. In the finishing room the heel is first trimmed into shape, and then smoothed with sandpaper. The sole is treated in the same way, and the edges of both are then coloured and burnished with machine-driven hot irons. In welted shoes a machine now makes the prick marks between the stitches, and the bottoms are then coloured, and given a gloss by revolving brushes and pads. The shoe is then finished and ready for wear. There are a number of other methods of making shoes by machine, most of them being based on one of those described. See B. E. Hazard, *The Boot and Shoe Industry*, 1921; H. Norris, *Costume and Fashion*, 1924-38; C. W. H. Mander, *Description and Historical Account of the Guild of Cordwainers*, 1931; E. Bordoli, *Footwear*, 1933; J. Korn, *Boot and Shoe Production*, 1954.

Booty (term allied to the O.E. *bot*, later 'boot,' meaning 'advantage'), plunder, usually obtained by violent means. In a special sense it denotes things taken by land forces in war. In England the High Court of Admiralty has jurisdiction to try any question concerning B. of war which may be referred to it by the Privy Council. Property captured by the naval forces is called 'prize' and forms the peculiar province of the prize court of the Admiralty. See also PRIZE.

Bopp, Franz (1791-1867), Ger. linguist.



British United Shoe Machinery Co. Ltd
CROSS-SECTION OF A CEMENTED OR STUCK-ON SHOE

A, Insole. B, Little wavy staples holding upper to insole. C, Bottom filling. D, Outsole attached by adhesive.

light-weight shoes. The first process in making the uppers is cutting them out according to pattern. The skin is laid upon a bench, the pattern is placed on the top of it, and the leather is cut round the edges of the pattern with a sharp knife. The various pieces of the uppers are then sent to the machine room. A variety of machines are here used: stitching machines, fancy perforating machines, edge-folding machines, barring machines, machines for trimming the edges of the leather, sewing-machines of various kinds, etc. In lace-up boots a single machine punches the hole, puts in the eyelet, and fastens it. The leathers that have to be seamed or folded are 'skived' first, then they are pasted together and placed under

With his first work—*Über das Conjugationssystem der Sanskritsprache in Vergleichung mit jenem der griechischen, lateinischen, persischen und germanischen Sprache*, 1816 (Eng. revision, 1820)—he became the founder of 'Comparative Grammar' of Indo-European languages, and initiated the era of modern linguistics. His main work is *Vergleichende Grammatik des Sanskrit, Zend, Griechischen, Lateinischen, Lithauischen, Gothischen und Deutschen* (6 parts), 1833-52 (3rd ed., 2 vols., 1868-71). He also ed. various texts, and his *Sanskrit Grammar* passed through sev. eds. (1827-63).

Boppard, Ger. tn in the Land of Rhineland-Palatinate (q.v.), on the Rhine (q.v.), 34 m. NW. of Mainz (q.v.). It was once a free city of the empire, and has a fine 12th-13th-cent. church. Pop. 8000.

Bora, Catherine von (1499-1552), wife of Luther, whose father had placed her in the convent of Nimbschen, near Grimma. Under the influence of Luther's doctrines she fled with 8 of her companions in 1523. Luther placed them in honourable families and assumed the task of getting them advantageously married; he himself married Catherine. This was in the period of his poverty, but Catherine proved a true helpmeet in trouble. She survived the death of her husband by sev. years, and moved from Wittenberg to Leipzig, where she took in boarders for her living. She later returned to Wittenberg, but moved from there because of the plague, and on the road to Torgau had an accident from which she d.

Bora, It. name for the violent, cold, dry, N.E. wind which is common in winter in the Adriatic, especially along the Istrian and Dalmatian coasts. The cause of the prevalence of this wind is the sudden increase in barometric pressure which takes place over the plateaux of Europe in winter, thus sending the cold air into the valleys and over the Adriatic Sea. It is usually strongest in the morning and least at night, and is precisely similar in character to the mistral which is found along the Fr. Mediterranean littoral. When it is associated with a depression over the Adriatic heavy rain or snow may occur.

Bora-Bora, or Bola-bola, is. in the group called Society Is. It rises to a height of 2165 ft. During World War II it was an Amer. air and naval base and has a 5200-ft airstrip.

Boric Acid, or Boric Acid, H_2BO_3 , a crystalline substance, found native in the volcanic lagoons of Tuscany. B. A. is also contained in the vapours which are exuded from fissures in the rocks of the same dist. The gases are brought into contact with water, which dissolves the B. A. when heated and is afterwards evaporated to recover the crystals. B. A. is soluble in hot water and alcohol, and is of use as an antiseptic, as it kills micro-organisms without affecting living tissue. It is usually employed in the form of an ointment, being an excellent remedy for a scurfy condition of the scalp in infants. It is also used for ulcerated nipples and as a dressing in surgery. The aqueous

solution is effective in cleansing cuts, abrasions, and scratches, and absorbed in socks checks excessive perspiration in the feet.

Borage (*Borago officinalis*), herb with rough stem and small blue flowers. It is cultivated as a garden flower in the U.K. and is occasionally found wild. It is used as a garnishing in claret-cup and other drinks.

Boraginaceae, family of dicotyledons native to tropical and temperate climates, consisting chiefly of herbs, but also of shrubs and trees. The flowers are hermaphrodite, regular and hypogynous, the calyx has 5 joined sepals, the corolla 5 joined petals; there are 5 stamens, and 2 superior carpels, generally deeply divided into 4 lobes with a single style rising between them. The fruit consists of a drupe or 4 achenes. The leaves are alternate and roughly hairy. Chief genera are *Anchusa*, *Arnebia*, *Borago*, *Brunnera*, *Caccinia*, *Cordia*, *Cynoglossum*, *Echium*, *Heliotropium*, *Lithospermum*, *Macromeria*, *Myosotidium*, *Onosma*, *Pulmonaria*, *Symphitum*, and *Tournefortia*.

Borah, William Edgar (1865-1940), Amer. senator, b. at Fairfield, Illinois, educ. at S. Illinois Academy, Enfield, and at the univ. of Kansas. B. was conspicuous among those who defeated Wilson's attempt to bring the U.S.A. into the League of Nations. Nevertheless it was through B.'s action that the negotiations resulting in the Disarmament Conference (Nov. 1921) were undertaken; and it was he who proposed 'outlawry of war' in the Senate in 1923. From 1925 to 1933 he was chairman of the Senate Committee on Foreign Affairs. He fought against the repeal of the Neutrality Act, 1939.

Borås, tn of Sweden in the prov. of Älvsborg; makes artificial silk and other textile fabrics, iron wares, and trades in cattle, horses, and iron. Pop. 62,623.

Borax, sodium tetraborate, $Na_2B_4O_7$, a substance found in nature in the form of monoclinic crystals, white or greyish in colour, transparent or translucent, with a hardness of 2 to 2½ and a sp. gr. of 1.7. B. was known in early times, being extracted, under the name of tincal, from the salt lakes of Tibet. It is also found in California and Nevada, and in the desert of Atacama in S. America. It is manuf. from boric acid, which is fused with half its weight of sodium carbonate, the B. being dissolved out with warm water. On being fused B. forms a globule. It combines on fusing with the oxides of many metals, forming globules of characteristic colours, therefore providing a test for the detection of certain metals. B. is also used in the glazing of pottery and in glassmaking.

Borch, Gerard Ter, see TER BORCH.
Borchgrevink, Carsten Egeberg (1864-1934), Norwegian explorer, b. Oslo; his father was Norwegian, a barrister by profession, his mother was English. He was educ. at Gjersten College; graduated Royal College, Tharandt, Saxony. When the *Antarctic* sailed from Melbourne in 1894 under Capt. Christensen, B. shipped

as an ordinary seaman, and was one of the first men to set foot on the Antarctic continent. In 1898 he was placed in command of Sir George Newnes's *Southern Cross* expedition, and in 1902 investigated the volcanic disturbances in the W. Indies. See the *Report of the Sixth International Geographical Congress*, London, 1895, pp. 169-75. He wrote *First on the Antarctic Continent*, 1901, and *The Game of Norway*, 1920-5. In 1930 he was awarded the Patron's Medal of the Royal Geographical Society of London. Obituary appears in *Norsk Geografisk Tidsskrift*, Bd. 5, Heft 2, 1934.

Borda, Jean Charles de (1733-99), Fr. mathematician and physicist, b. Dax, in the dept of Landes. He served in both the army and the navy and distinguished himself by the introduction of new methods and instruments connected with the sciences of navigation, astronomy, and geodesy. His most important invention was that of the reflecting circle. He was one of the men of science who framed the new system of weights and measures adopted in France under the Republican gov. He pub. *Description and Use of Circle of Reflection*, 1778, and *Table of Logarithms*, 1804.

Bordarii (from Low Lat. *borda*, a cottage), or **Cotarii**, were tenants under the feudal system, who, in return for menial services, chiefly field labour, possessed holdings of from 1 to 5 ac. They had neither oxen nor plough and were inferior in rank to the villeins, though they were certainly not slaves.

Borde, Andrew, see **BOORDE**.

Bordeaux, Duc de, see **CHAMBORD, COMTE DE**.

Bordeaux, Henry (1870-), Fr. novelist, b. Thonon, educ. at the Sorbonne and the Paris Faculty of Law. He practised law, 1890-1900, then turned to literature. During the First World War he served in the army, becoming an officer of the Légion d'Honneur, and receiving many foreign orders. In 1919 he became a member of the Fr. Academy, and in the same year he lectured in London on Verdun, in the defence of which he took part. He is an honorary Docteur de l'Université de Montréal. A prolific writer, his works include *Le Pays natal*, 1900, *La Peur de vivre*, 1902, *Le Lac noir*, 1904, *La Croisette des chemins*, 1909, *La Robe de laine*, 1910, *La Résurrection de la chair*, 1920, and *Yamile sous les cèdres*, 1923. Among more recent books may be mentioned his fiftieth novel, *Cendres chaudes*, 1938, and *La Sonate au clair de lune*, 1942.

Bordeaux (anc. **Burdigala**), Fr. city, cap. of the dept of Gironde, on the Garonne (q.v.), 351 m. SW. of Paris. It is the fifth city of the country, one of the chief ports of France, and lies near the head of the Gironde (q.v.) estuary, about 60 m. from the Atlantic. In ancient times it was the cap. of the Bituriges Vivisci (q.v.), and, later, under the Romans was an important tn of Aquitania (q.v.). It suffered under the incursions of the Vandals, Goths, and Franks (qq.v.), and was in Eng. hands 1154-1453, during which

time it developed great prosperity. There were risings in B. during the Fronde (q.v.), and the tn was a centre of the Girondists (q.v.) in the 18th cent. The National Assembly under Thiers (q.v.) met at B. 12 Feb.-1 Mar. 1871, and the tn was also the seat of the Fr. Gov., Sept.-Dec. 1914, and 15-30 June 1940. The old part of the tn is distinguished by narrow, crooked streets, but the newer parts are very well laid out, as a result of much rebuilding in the 18th cent., when B. fl. upon its trade with the Fr. colonies. There are splendid streets and squares, notable among them being the Place des Quinconces, with its great statues of Montaigne and Montesquieu (qq.v.), both natives of the B. dist. There is an archiepiscopal cathedral (12th-15th cents.), with fine towers, a 15th-cent. campanile, a univ. (founded 1441), an 18th-cent. theatre, sev. fine old churches, and museums and libraries. The prin. industries are iron and steel engineering, shipbuilding, oil and sugar refining, and the manuf. of chemicals, aircraft, and foodstuffs. Some of this industry is concentrated in the suburbs of Cenon and La Bastide on the r.b. of the riv. The port has an extensive trade: the prin. exports are wines, and among the imports are coal, chemicals, oil, and foodstuffs and wines from Fr. overseas possessions. Pop. 257,950.

Bordelais, old name of a dist. of SW. France, in Aquitaine (q.v.). It lay between the Rs. Dordogne, Drot, and Garonne, and the chief tn was Bordeaux (q.v.).

Borden, Mary (1887-), novelist, b. Chicago. Educ. at Vassar, she served in a Fr. hospital during the First World War and was awarded the Croix de Guerre and made a member of the Légion d'Honneur. In 1918 she married Maj.-Gen. Sir Edward Spears, settled in London, and became a Brit. subject. Her novels include *The Romantic Woman*, 1919, *Jane, Our Stranger*, 1922, *Three Pilgrims and a Tinker*, 1924, *Four O'clock*, 1926, *Flamingo*, 1927, *Forbidden Zone*, 1929, *Sarah Gay*, 1931, *The Black Virgin*, 1937, No. 2 *Shovel Street*, 1949, and *Martin Merriedew*, 1952.

Borden, Sir Robert Laird (1854-1937), Canadian statesman and lawyer. Succeeded Sir Wilfrid Laurier after his defeat on the Reciprocity Bill at the general election in 1911. He was b. Grand Pré, Nova Scotia. In 1878 he was called to the Bar and practised in Halifax, becoming eventually president of the Nova Scotia Barristers' Society. In 1896 he represented Halifax in Parliament, but lost his seat in 1904 and was elected for Carleton. In 1908, however, he was returned for both places, and from 1901 led the Conservative opposition. Responsible for Canada's offer, in 1912, of 3 battleships for the home country, a policy which was the subject of lively discussion. During the First World War he shouldered the chief share of the task of guiding Canadian affairs and was in office as Prime Minister and secretary of state for external affairs throughout. In 1916 he was invited to attend meetings of the

Brit. Cabinet in London, this being the first occasion on which a dominion statesman had been summoned to take part in a Cabinet discussion in Great Britain. He was returned again at the general election of 1917. He attended the Imperial Conference in 1917 and 1918 and went to Paris as one of the Canadian representatives at the Inter-Allied Peace Conference of 1919. Resigned premiership in 1920, being succeeded as Conservative leader by Mr Arthur Meighen. G.C.M.G., 1914.

Border. The name referring to a stretch of country on both sides of the frontier between England and Scotland. The term has 3 distinct uses, and can be applied historically, geographically, and in a literary sense. The actual boundary between the 2 countries is a line beginning about 3 m. W. of Berwick, along the line of the Tweed to the Cheviot Hills which become for some 35 m. the line of demarcation; hence the boundary continues along the line of the Liddel and the Esk for a short distance, and thence to the line of the Sark, which it follows to the Solway Firth. The actual length of the boundary line is 108 m., whilst by taking the distance as the crow flies it is no more than seventy miles. At the extreme E. of this line is the ter. known as the Liberties of Berwick, an area of about 8 sq. m. which encloses the present tn of Berwick. The only Eng. B. cos. are Northumberland and Cumberland, but on the Scottish side, in addition to the actual B. cos. of Berwick, Roxburgh, and Dumfries, there are included in the term also the cos. of Selkirk and Peebles, which historically have always been included. The country on the Eng. side of the B. is chiefly bleak and rugged moorland, only pasturing sheep and cattle, but on the N. side there are great stretches of fertile land, a country of dales and valleys, possessing a natural beauty and famous for its picturesqueness. The B. country is watered on the N. side by the Tweed, the Whiteadder, Loct, Kale, Jed, Kershope, Liddel, Esk, and Sark, whilst on the Eng. side are the Rs. Till, Boumont, Coquet, Rede, and the N. Tyne. The hist. of the B. was for some 1500 years extremely stormy. During the Rom. occupation the original inhab. and the Picts of still further N. were held in check by the Rom. walls. The earliest inhab. seem to have been the Brigantes, who held both sides of the B., and were a fierce and warlike tribe. They gave trouble to the Romans, but eventually the Romans brought them at least to nominal subjection, and built the wall of Antoninus from the Clyde to the Forth. But even at this early date the B. was a dist. with a distinct hist. of its own, since the land between the 2 walls (Hadrian's and Antoninus's) was never actually conquered, and never really held by the Romans. The evacuation of Britain by the Romans resulted in the B. country becoming the battleground for the invaders from the N. (the Picts), the invaders from over the sea (the Angles), and the hapless Britons, until finally the whole of the B. country

was divided into the kingdoms of Strathclyde, Bernicia, and Deira. Bernicia and Deira were later united to form the kingdom which stretched from the Humber to the Forth. But the country continued to be agitated by the constant warfare between Scot and Angle, and later the Viking joined in the struggle. The hist. of the B. between the 6th and the 11th cents. is the hist. of continued warfare, raids, and bloodshed. The struggle, which had its origin in the quarrels of more or less petty tribes, began, with the development of the tribes into nations, to assume a national aspect. The struggle was now one for the permanent possession of the valley of the Tweed. Finally, the Scottish kings snatched Lothian from the hands of the English, and also had designs upon Cumberland, which, though nominally ceded to the Norman kings in the reign of William Rufus, was nevertheless contested between the 2 nations for a considerable time. Amid the constant warfare the development of the country had gone on, especially on the Scottish side. The Celtic Church had been responsible for this to a very large extent. With the coming of the Celtic monks, churches had sprung up in the wilds of Northumberland, and in the fertile valleys and dales of the Scottish lands. Monastery and church dotted the countryside, and on the Scottish side grew up the large and flourishing tns of Berwick, Jedburgh, and Roxburgh. But the death of Alexander III in 1286 plunged Scotland and England into the war of the succession, and the determined efforts of Edward I to achieve his dream of a united Great Britain made the B. the battlefield of the 2 countries. The country was harried and ransacked by both sides. Northumberland was practically laid waste, the tns of Roxburgh and Jedburgh fell into the general ruin, and from that time until the beginning of the 17th cent. the B. was rarely at peace. Many battles took place here, amongst them Halidon Hill (1333), Otterburn (1388), Nisbet (1402), Homildon (1402), Hedgeley Moor (1464), Flodden (1513), Solway Moss (1542), and Ancrum Moor (1544)—these in addition to the many skirmishes which took place between the B. families. The important defeat of Montrose at Philiphaugh by Leslie also belongs to the hist. of the B. The B. was kept in peace more or less by the building of numerous castles, which were to overawe the moss-troopers and the freebooters of the neighbourhood. The B. was during the 15th and 16th cents. administered by wardens appointed respectively by the sovereigns of England and Scotland, the B. at this time being divided into 3 marches, over each of which ruled, practically as sovereigns, the Eng. and Scottish wardens. When in 1603 James VI of Scotland succeeded to the throne of England as James I, peace on the B. became more possible. James I even desired to do away with the name B., but the term has always been kept. The castles, however, were dismantled, the garrisons reduced, and gradually the B. became accustomed to peace. A number

of fortresses, important in B. warfare, remain as pleasant little tns at the present day, but a number are in ruins.

The B. produced a distinct literature of its own. The B. ballads sang the deeds of the B. heroes, the heroes who led their little bands of followers to attempt deeds which a larger army would not have dared to attempt. The ballad of *Chevy Chase* is typical of the B. minstrelsy. But the open life of the Borderer found expression also in the more sentimental side of literature, and the beauties of his native hill and dale did not escape him. Sir Walter Scott rescued the ballad poetry, and the traditions of the B. literature found expression in James Hogg (the Ettrick Shepherd), John Wilson (Christopher North), and John Mackay Wilson.

Border Regiment, The, formed in 1881 by the linking of the 34th and 55th Foot. The 34th Foot was raised in 1702, and almost immediately went on active service to Spain, then later under Marlborough. It was present at Dettingen and Fontenoy. For its conspicuous behaviour at Fontenoy it was awarded a laurel wreath, a unique distinction. It served in the Peninsular and Crimean wars and Indian mutiny. The B. R. is the only one with the Peninsular battle honour 'Arroyo dos Molinos.' The 55th Foot was raised in 1755, and went to America in 1757; fought in the war of Independence and campaigns in W. Indies, China, and Crimea. During the First World War it raised 16 battalions, which served in France, Flanders, Italy, Macedonia, Gallipoli, Egypt, and N.W. Frontier, India. In the Second World War the B. R. fought in France and Belgium and in N.W. Europe generally. They played a distinguished part in the battle of Arnhem in Sept. 1944. Other units, in the Fourteenth Army (q.v.), were part of Wingate's Chindits and also fought in the Irawadi R. battles. The B. R. is to be amalgamated with the King's Own by 1959.

Border Town, small post tn of S. Australia, situated in the co. of Buckleham, about 180 m. SE. by S. from Adelaide.

Border Warrant, old form of process in Scots law, used for detaining the person of an absconding Eng. debtor.

Bordes, Charles (1863-1909), Fr. musical composer, b. La Roche-Carbon. He studied in Paris with Marmontel and César Franck, but only took up music professionally in 1887, beginning as a church organist and choirmaster. Appointed choirmaster of Saint-Gervais, Paris, he organized the world-famous choir, the Chanteurs de Saint-Gervais. His work in restoring to Fr. church music the tradition of plainsong and the music of old masters heralded the reforms of Pius X. In 1900 the Schola Cantorum, of which he was co-founder with Guilmant and d'Indy (1894), became a high school of music. The catalogue of his works includes, besides church music, some instrumental music, among which may be mentioned *Rapsodie basque*, 1899, and *Les Trois Vagues* (an unfinished lyric drama).

Bordet, Jules (1870-), Belgian bacteriologist, b. Soignies and educ. at Brussels Univ. where he qualified in medicine in 1892. From 1894 to 1901 he worked at the Pasteur Institute in Paris, and was then appointed director of the Pasteur Institute in Brussels. In 1907 he became prof. of pathology and bacteriology at the univ. of Brussels. He discovered the phenomenon of bacterial haemolysis (1898); with O. Genoux he devised the complement-fixation reaction (1901), of value in tests for the diagnosis of certain infectious diseases, especially the Wassermann reaction for syphilis, and in immunology. These 2 workers discovered *Haemophilus pertussis*, the micro-organism causing whooping cough. B. wrote *Traité de l'immunité*, 1920. He was awarded the Nobel Prize in 1919.

Bordighera, It. tn, in Liguria (q.v.), on the Riviera (q.v.). It is a much-frequented winter resort, known for its palms (used in Rome on Palm Sunday, q.v.), fruit, and flowers. It has Rom. remains. Pop. 9000.

Bordj-bou-Argeridj, tn of Algeria, situated in the dept. of Constantine, on the high plateau of Madjana. Cattle are reared, and grain is grown in the dist. Pop. 12,000.

Bordj-Menafel, tn of Algeria, in the dept. of Algiers and the dist. of Tiziuzon. Pop. 18,000.

Bordone, Paris (1500-71). It. painter of the Venetian school, b. Treviso, a pupil of Titian. He was the fashionable portrait-painter of Venice, and in 1538 was invited to France by Francis I, whose portrait he painted. Though portraiture was his forte, he also painted scenes from mythology, allegories, and religious subjects. His great painting is 'The Fisherman presenting the Ring of St Mark to the Doge,' c. 1535, in the academy at Venice. The National Gallery has his 'Daphnis and Chloe,' and a portrait of a lady, and his 'Lady at her Toilet' is in Edinburgh. Other notable paintings are the 'Adoration of the Shepherds' (in Treviso Cathedral), some mythological pictures at the Villa Borghese, and a 'Madonna' in the Louvre. Others of his works are to be seen in Cremona, Milan, Genoa, Florence, etc. He was typically Venetian in his colour and noted for his fine flesh tones.

Bordure, heraldic term denoting the border which surrounds the shield, and generally occupies one-fifth of the field. It is sometimes used as a mark of difference, particularly in Scotland. A B. componée is one divided into 16 small squares of alternate tinctures. A great variety is found in B.s; they are engrailed, invected, wavy, etc. With rare exceptions, the B. surmounts all ordinaries.

Bore, or **Eagre**, phenomenon which occurs in some rivs. in spring tides. At such times the inflowing water rises to a considerable height and moves along against the current like a wall. It is due to the fact that the volume of the tidal wave is greater than the riv. can receive without being greatly disturbed. The height of the B. varies from 3 ft to 12 ft.

The latter height is attained by the B. of the Brahmaputra. In England B.s may be observed in the Severn, the Trent, the Wye, and the Solway.

Bore (in fire-arms), see GUN.

Boreas, god of the N. wind, son of Astræus and Eos, brother of Hesperus, Notus, and Zephyrus, with whom he dwelt in a cave on Mt. Hæmus in Thrace. When the Athenians invoked his aid against Xerxes' fleet, a storm destroyed part of it, whereupon they built him an altar on the banks of the Ilissus.

Borecole, see KALE.

Boree, an Australian tree, *Acacia pendula*, also the Weeping Myall. Yields a close-grained, violet-scented hardwood which is useful for cabinet-making.

Boreham Wood, see ELSTREE.

Borel d'Hauterive, Joseph Pétrus (1809-1859), Fr. novelist and poet, b. Lyons. He was educ. in Paris, and was intended to be an architect, but soon gave up any attempt at making a living by architecture, and became a writer. He was one of the most devoted and extravagant followers of the Romantic school. Most of his life was spent either in Paris or in Algeria. His chief works are *Rhapsodies* (poems), 1832; a vol. of short stories, *Champavert*, 1833, in which his talents were best displayed; and *Madame Putilphar*, 1839, to which he wrote a preface in verse. See A. Mario, *Pétrus Borel*, 1922.

Borelli, Giovanni Alfonso (1608-79), It. physicist and mathematician, b. near Naples. In 1649 he became prof. of mathematics at the univ. of Messina and then at Pisa. He returned to Messina later, but having taken part in some political affair, was forced to retire to Rome, where he lived under the protection of Christina, Queen of Sweden. He was the first to suggest the parabolic path of comets, and he was the founder of the iatro-mathematical school, since he attempted to explain the movements of the body on mechanical principles. He stated his theory of the circulation of the blood in *De Motu Animalium*, but very erroneous conclusions were reached. He wrote works on mathematical, medical, and astronomical subjects.

Borénus, Tancred (1835-1948), Finnish historian of art, b. Wiborg, Finland, son of Carl B., sometime member of the Finnish Diet. Educ. at Helsingfors Univ.; appointed prof. of hist. of art, Univ. College, London, 1922. Diplomatic representative of Finland in England, 1919. His numerous works include: *The Painters of Vicenza*, 1909, new ed. of Crowe and Cavalcaselle's *History of Painting in Italy*, 1912, *Catalogue of Viscount Lee of Fareham's Collection*, (2 vols.), 1923, *English Primitives*, 1924, *English Medieval Painting*, 1927 (with E. W. Tristram), *Florentine Frescoes*, 1930, *Catalogue of the Pictures and Drawings in the Collection of the Earl of Harewood*, 1936, *English Painting in the XVIIIth Century*, 1938, *Italian Painting and Later Italian Painting*, 1945, and *Dutch Indoor Subjects*, 1946.

Borers, beetles which pierce the wood on which they feed and thus do much

damage. There are many species contributed by such genera as *Anobium* and *Ptinus*. Also a family of fish (Myxinidae) called hag-fishes (q.v.), B., or slime-eels; have no suckers, but have 4 pairs of tentacles over the mouth and terminal nostril. Hags burrow right into fishes, devouring them until nothing is left but skin and bones. *Myxine*, with half a dozen gill-pouches but only 1 gill opening, is a widely distributed genus. *M. glutinosa* of the N. Atlantic is troublesome to fishermen, having a preference for attacking fish already caught on lines. See also BORING SPONGES; BORING-WORM; TEREDO.

Boreus, genus of mecopterous insects included in the family Panorpidæ, and related to the scorpion-flies. They have biting mandibles and the wings are absent. *B. hiemalis* is a native of Europe and America and is found in the winter months only. It is about a quarter of an inch long, and of a greenish colour with reddish legs.

Borga, see PORVOO.

Borger, tn in the prov. of Drenthe, Netherlands, 11 m. SE. by E. from Assen. Pop. 10,350.

Borgerhout, suburb of Antwerp, Belgium. Its manufs. are tobacco, candles, and tapestry. There are bleaching and dye works. Pop. 50,000.

Borgese, Giuseppe Antonio (1882-1952), It.-Amer. author, b. Polizzi Generosa, Sicily. He became prof. of Ger. literature at Rome Univ. in 1910, and in 1917 transferred to Milan Univ., where in 1926 he became prof. of the faculty of letters. He was active as journalist, critic, novelist, dramatist, and poet. At the early age of 20 he wrote a *History of Romantic Criticism*, and followed this by a study of the work of Gabriele D'Annunzio. In both of these the young student was inspired by the example of Benedetto Croce. In 1921 he pub. the novel *Rube* (Eng. trans., 1923), in which It. critics see a portrayal of the duel between the warlike idealism and the basic pacifism of the Italians. B. was an opponent of Fascism, and in 1931 left Italy for the U.S.A., where he became a naturalised American in 1938. In 1936 he took the post of prof. of It. literature at Chicago Univ. Later books include *On Dante Criticism*, 1936, *Goliath: the March of Fascism*, 1937, *The City of Man*, 1940 (together with Thomas Mann), and *Common Cause*, 1943.

Borghese, name of a celebrated It. family of Siennese origin, which is first prominent in the hist. of the rep. of Siena at the beginning of the 13th cent. One of its number settled in Rome during the 16th cent., and a son of this member of the family became Pope, with the title of Paul V, in 1605. The family fortunes were much advanced by the Pope, who created a nephew Prince of Vivaro, and a little later the title of Prince of Sulmona was conferred on the same nephew by the King of Spain. The son of this prince raised the family fortunes by his marriage with a daughter of the Aldobrandini family, one of the oldest and richest families of Rome. Camillo Filippo Ludovico, Prince B., married the sister of

Napoleon in 1803. He was made Duke of Gustalla, and later governor of the provs. of Piedmont and Genoa. He sold the art treasures of his house to Napoleon. After the fall from power of Napoleon he retired to Florence, where he lived until his death in 1832. The B. palace (q.v.) at Rome is one of the most magnificent of the buildings of that city.

Borghese, Giovanni Ventura (1640-1708), It. painter, pupil of Pietro da Cortona, whom he helped in some of his chief works at Rome. After his master's death B. completed some of his unfinished paintings. In the church of San Niccolò da Tolentino are his pictures 'The Annunciation' and 'The Virgin Mary crowned

inner court has 2 tiers of granite colonnades, with Doric columns below and Corinthian above. In it are huge ancient statues of Sabina, Julia, and Ceres. Its wonderful collection of art treasures was sold by public auction, 1892, by Prince Paolo Borghese. Many of its fine pictures have been removed to the Villa Borghese (see BORGHESSE VILLA), belonging to the It. state. Pope Leo XIII acquired the important family archives for the Vatican. The picture gallery still includes a Madonna of Botticelli, and 1 by Lorenzo di Credi, 2 Evangelists by Michelangelo, 4 paintings of Raphael (1 being 'The Burial of Jesus'), Titian's 'Sacred and Profane Love,' and his 'Three Graces,'



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THE VILLA BORGHESSE, ROME

by Angels.' Four scenes from the life of St Catherine in the church of Città di Castello are considered his finest works.

Borghese, Villa, summer residence at Rome of the Borghesi till 1902, outside Porta del Popolo; built by Cardinal Scipione Caffarelli-Borghese on the Cenci estate, after plans by Giovanni Vassanzio (early 17th cent.). It has a magnificent park of over 200 ac. Its grand collection of works of art was sold to Napoleon by Prince Camillo Borghese, 1806. Some of these were restored in 1815, the remainder are in the Louvre. A new collection of sculptures and pictures was formed later. Among the treasures contained are Algarde's 'Sleep' and Canova's famous statue of the reclining figure of Pauline Borghese. See BORGHESSE PALACE. Both villa and park became the property of the It. state, 1902. See M. L. Gothein, *History of Garden Art* (Eng. trans.), 1928.

Borghese Palace, one of the most magnificent buildings in Rome, in the Piazza Borghese, in residence of the Borghesi. Built between 1590 and 1607 by Martino Lunghi and Flaminio Ponzio, and known, from its shape, as 'Il Cembalo.' The

Correggio's 'Danaë,' Van Dyck's 'Christ on the Cross' and portrait of Maria de' Medici. There are also canvases of Andrea del Sarto.

Borghesi, Bartolommeo (1781-1860), It. savant, b. Savignano, near Rimini. He was a student of the documents of medieval times, and so ruined his eyesight by close reading that he had to give up his study of documents, and turn to numismatics. He was responsible for the arranging and cataloguing of the coins of the Vatican. He retired from Rome in 1821 to San Marino, where he spent the rest of his life, taking some little part in the politics of that rep. He estab. a reputation by his great work, *Nuovi Frammenti dei Fasti Consolari Capitolini*, 1820. His works on numismatics also added to his reputation. His complete works were pub. by order of the Emperor Napoleon III, the first vol. appearing in 1862, and the tenth and last in 1897.

Borghesi, Ippolito, It. painter, native of Naples (fl. towards end of 16th or beginning of 17th cent.), pupil of Francesco Curia. Painted historical and religious subjects; imitated Raphael and

Andrea del Sarto. Chief works: Altarpiece in chapel of Monte di Pietà at Naples ('Assumption of the Virgin'), and another in San Lorenzo at Perugia.

Borghetto, It. vil., in Trentino-Alto Adige (q.v.), on the Adige (q.v.), 26 m. SSW. of Trento. It was the scene of a victory of Napoleon (q.v.) over the Austrian general, Beaulieu, in 1796. Pop. 500.

Borhorst, Ger. tn in the Land of N.-Rhine-Westphalia (q.v.), 68 m. NNE. of Düsseldorf (q.v.), with textile manufs. Pop. 9000.

Borgia, It. family who came originally from Valencia, Spain. One of its members, Alonso de Borja (1378-1458), was a bishop and private secretary to Alfonso of Aragon, and accompanied him to Naples. This Borja in 1455 became Pope as Calixtus III and settled a number of his family in Italy. His nephew, Rodrigo de Borja (1431-1503), also became Pope as Alexander VI (q.v.), and from that time the prin. seat of the family was in Italy, and the name was changed to B. Before Alexander became Pope he had a number of children by a Rom. girl, who was known as Vanozza, but whose real name was Giovanna dei Cattani. Two of these children, Lucrezia and Cesare, subsequently achieved considerable notoriety, and are listed below:

Cesare Borgia (1476-1507). From birth he was vowed to the priesthood, and he became a cardinal when only 17 years old, but was dispensed from holy orders in 1499 and married Charlotte d'Albret, princess of Navarre. He succeeded his brother Giovanni, whose murder he had arranged, as captain-general of the Church. Whilst his father, Alexander VI, was crushing the feudal power of the barons in the Romagna, Cesare undertook the task of recovering all the fiefs along the Adriatic coast which had ceased to acknowledge the overlordship of the Holy See. Cesare was a brilliant soldier, though unscrupulous and extremely cruel. He made himself master of the Romagna, Perugia, Siena, Piombino, and the Duchy of Urbino. He was named Duke of Romagna by the Pope, but in 1503 Alexander VI d. Pius III, his successor, d. after a few weeks, and was succeeded by Julius II, an enemy of the B. family. Cesare was forced to surrender to him at Naples. He was removed to Valencia and later to Medina del Campo, but escaped and went to the court of Navarre, where he was placed in command of the royal forces, but was killed in battle, 12 Mar. 1507. He was a patron of art, and befriended Leonardo da Vinci (q.v.). Though personally cruel and entirely dominated by his lust for power, the people whom he governed regarded him as an upright and able administrator. It was to him that Machiavelli (q.v.) dedicated his treatise *The Prince*.

Lucrezia Borgia (1480-1519), Duchess of Ferrara, was married first to Giovanni Sforza, secondly to the Duke of Biscelgie, and thirdly to the Duke of Ferrara. Historical evidence fails to confirm the picturesque crimes imputed to her in

relation to her supposed natural son, Gennaro. She left behind a reputation for learning, beauty, and charity, and is said to have enjoyed the respect of her subjects. See F. B. Corvo, *Chronicles of the House of Borgia*, 1901; L. Collison-Morley, *The Story of the Borgias*, 1932; and N. Balchin, *The Borgia Testament*, 1948.

Borgia, Francesco St (1510-72), third general of the Jesuit order, the duties of which post he prosecuted with the utmost zeal and prudence. Beatified by Pope Urban VIII, and canonised by Clement X in 1671. His feast is on 10th Oct.

Borglum, John Gutzon de la Methe (1867-), Amer. sculptor, b. Idaho. He studied at the San Francisco Art Association. His works are chiefly remarkable for their enormous size—especially that on the rock of Stone Mt., Georgia, a memorial to the Confederate Army. His brother, Solon Hannibal B., was a sculptor of wild W. subjects.

Borgne, lake in the U.S.A., situated in the SE. of Louisiana. It is about 25 m. wide, and touches the Gulf of Mexico on the E.

Borgo San Donnino, see FIDENZA.

Borgo San Sepolcro, see SAN SEPOLCRO.

Borgo Val Di Taro, It. tn. in Emilia-Romagna (q.v.), on the Taro, 36 m. SW. of Parma (q.v.). It is a mt holiday resort. Pop. 2500.

Borgognone, Ambrogio (d. 1523), It. painter of the late 15th and early 16th cents. He was a contemporary of Leonardo da Vinci, his real name being Ambrogio di Stefano da Fossano. The name B. is probably due to the fact that he was closely associated with the Burgundian school of art. His chief claim to fame lies in the work of decoration which he did for the Certosa, the convent of the Carthusians, at Pavia. After his return from Pavia to Milan he painted a series of frescoes for the great church of San Simpliciano. Two examples of his work at the Certosa are in the National Gallery.

Borgognone, Jacopo Cortesi (1621-76), It. painter, b. St Hippolite, Burgundy, the son of a minor artist. Many of his most famous battle pictures record the achievements of his patron, Prince Matthias of Florence, and his best work is in the Palazzo Pitti at Florence. He spent the last part of his life in a Jesuit house.

Borgomanero, It. tn. in Piedmont (q.v.), 22 m. NW. of Novara (q.v.). It has copper manufs. Pop. 11,000.

Borgström, Hjalmar (1864-1925), Norwegian composer and critic, b. Oslo. He became music critic of the *Aftenposten* there in 1913. His operas were not successful, but he made his mark with orchestral, chamber, and piano music. He is best known by his symphonic poem of Shakespeare's *Hamlet*, though that entitled *Tanken* ('Thought') is regarded as his most important work. Another is based on Ibsen's play *John Gabriel Borkman*.

Borgu, extensive dist. in Africa partly in Dahomey, Fr. Equatorial Africa, and partly in Nigeria.

Borio Acid, see BORACIC ACID.

Borinage, coal-mining dist. of Belgium, lying S. and W. of Mons (q.v.), prov. of Hainaut.

Boring, see WELL and TRIAL BORING.

Boring Sponges (*Cliona*), species of siliceous sponges (Demospongiae). They excavate tunnels in limestone rocks and do considerable damage to jetties, breakwaters, etc. Oyster-shells will often be found to have been perforated by them.

Boring-worm (*Polydora ciliata*), species of marine bristle-worm (Polychaeta). They inhabit U-shaped tunnels which they excavate in the rocks.

Boris III (Boris Clément Robert Marie Pie Louis Stanislaus Xavier) (1894-1943), king or tsar of Bulgaria, b. Sofia, eldest son of Ferdinand, prince (later tsar) of Bulgaria, and Princess Marie Louise of Bourbon-Parma. To win over Russia, Ferdinand, a Catholic member of the Coburg family, had his heir converted, at the age of 2, to the Gk Orthodox Church. B. succeeded to the throne on the abdication of Ferdinand, 1918. In 1930 he married Giovanna, daughter of the King of Italy. His first child, Princess Marie Louise, was b. in 1933 and a son and heir, Prince Simeon, in 1937 (who succeeded him in 1943). B.'s position was fundamentally insecure throughout his reign, and he survived more than one attempt at assassination. Though he wished for better relations with his Balkan neighbours he adhered to Bulgarian territorial claims, and after Alexander of Yugoslavia's assassination in 1934, his attitude towards Yugoslavia cooled and he thereby alienated the sympathy of the Macedonian elements in Bulgaria. Nor did his policy please the army, which was Macedonian and revolutionary in outlook. In the same year a military coup overthrew the gov. of Agrarians and Democrats and B. was once more in danger of dethronement; but his popularity with the peasantry and his diplomacy, coupled with the dissensions in the army, saved him, and the militarist combination collapsed. In 1938 he was successful in securing the release of Bulgaria from the punitive clauses of the treaty of Neuilly. When the Second World War began B. attempted to keep his country neutral. But Bulgaria had no other market for her produce than Germany; the army was entirely dependent on Ger. arms; the general staff was largely pro-German; and Nazi intrigue was rife. With the fall of France and Rumania under Ger. 'protection' B. signed the Tripartite Pact, 1941, and Ger. troops were thereby allowed to occupy Bulgaria. B. collaborated with the Axis against his Yugoslav and Gk neighbours, with whom his gov. had concluded agreements of non-aggression, but, owing to pro-Russian popular feeling, B. did not declare war on the U.S.S.R., though he did declare war on Britain and the U.S.A. When the tide of events began to turn against the Axis in 1943 there were signs that B., always cunning and resourceful, was contemplating a coup with the help of elements of the army; but he d. shortly after paying a visit to Hitler, whether from natural

causes or whether at the hands of Ger. or domestic enemies is uncertain. An unscrupulous opportunism marked B.'s policy throughout the 25 years of his troubled reign.

Boris Fëdorovich Godunov, see GODUNOV.

Borislav (Ukrainian *Boryslav*; Polish *Boryslaw*), tn in Drohobych Oblast of Galicia (q.v.), W. Ukraine, 45 m. SW. of L'vov, with ozokerite mines (since 1846) and oil and gas wells. Pop. (1956) 30,000.

Borisoglebsk, Russian tn in the Voronezh Oblast, 120 m. E. of Voronezh. It has extensive food industries, and the well-known B. oak forest near by. It was founded in the 17th cent. as a Muscovite outpost, and prior to the 1930's was an important centre of the grain trade. Pop. (1956) 55,000.

Borja, Sp. tn in the prov. of Zaragoza. It has numerous ancient buildings, and once belonged to the great family of B. (see BORGIA). It has manufs of textiles and brandy. Pop. 6000.

Börjesson, Johan (1790-1866), Swedish poet and dramatist. He was educ. at Gothenberg and Uppsala, took holy orders, and became court preacher in 1821. His dramas were mostly historical, based on Schiller's interpretations of Shakespeare. The best known are *Erik den XIV*, 1842, *Erik den XIV's son*, 1847, and *Solen sjunker*, 1856. His chief lyrical work is in *Blommor och Trädr här en Dotters Graf*, 1854. He became a member of the Swedish Academy in 1861.

Borkhausia, see BARCHHAUSIA.

Borkum, is. in the N. Sea, belonging to Germany, and in the *Land* of Lower Saxony (q.v.). It is one of the E. Frisian group, and is situated between the E. and W. arms of the Ems estuary (q.v.). The is. is about 5 m. long, and half as wide. There is good pasture land for cattle, and numerous sea-birds find a breeding place upon it. It became a popular health resort, but is more noteworthy as part of the Ger. coast defence system. The dismantling of the is.'s defences after the First World War was incomplete, and the gun emplacements were not destroyed. During the Second World War the is. was heavily defended, principally by the Coastal battery of 4 11-in. guns and some 7 other batteries, including anti-aircraft guns. There were 16 radar stations, and the anti-aircraft defences of the is. claimed to have shot down over 100 allied planes. After the collapse of Germany in 1945, the total demolition of the defences of B. was put in hand. Pop. 3000.

Borlänge, largest tn in the prov. of Dalarna, Sweden, on the R. Dal, an important ironworking centre. The Domnarvets ironworks in B. are the largest in N. Europe. Pop. 23,828.

Borlase, William (1695-1772), antiquary, b. Cornwall and educ. Exeter College, Oxford. He was presented in 1722 to a living near Penzance, to which the vicarage of St Just was added in 1732. He pub. in his *Philosophical Transactions* an essay on Cornish diamonds, and was

made an F.R.S. in 1750. He subsequently produced sev. works, including *Antiquities of Cornwall*, 1754. He was made an LL.D. in 1766. He presented collections to the Ashmolean Museum at Oxford.

Borley Rectory, the reputedly haunted rectory 2½ m. from Sudbury, Suffolk, England, destroyed by fire in 1929. See Harry Price, *The End of Borley Rectory*, 1946.

Bormann, Martin Ludwig (1900-1945), Ger. Nazi leader, b. Halberstadt, Saxony. He joined the Nazi party in 1925, and in 1933 became chief of staff to Rudolf Hees, later succeeding him as third deputy to Hitler. After the defeat of Germany, he was missing and presumed dead, although tried in absence as a war criminal at Nuremberg. See the *Bormann Letters* (ed. H. Trevor-Roper), 1954.

Bormio, It. tn, in Lombardy (q.v.), in the valley of the Adda (q.v.). It is in the Alps (see ORTLER GROUP) near the Swiss border, and has thermal springs. Pop. 2300.

Born, Bertran de, see BERTRAN DE BORN.

Born, Max (1882-), physicist, b. Breslau. He occupied in succession the chairs of theoretical physics at the univs. of Berlin (1916), Frankfurt (1919), Göttingen (1921). In 1933 he came to England and became a lecturer at Gonville and Caius College, Cambridge, and was appointed Tait prof. of natural philosophy at Edinburgh in 1936. In 1939 he acquired Brit. nationality and was elected F.R.S. In 1954 he was awarded the Nobel prize, jointly with Walther Bothe, for fundamental work in quantum mechanics. He has made important contributions in many fields, including the statistical interpretation of wave functions, the use of perturbation theory for scattering problems, the B.-Oppenheimer theory of molecules, the theory of liquids, and of crystals. Amongst his Eng. books are *Einstein's Theory of Relativity*, 1922, *Problems of Atomic Dynamics*, 1926, *Mechanics of the Atom*, 1927, *Atomic Physics*, 1935, *The Restless Universe*, 1936, and *Experiment and Theory in Physics*, 1943.

Borna, Ger. tn in the dist of Leipzig, 15 m. SSE. of Leipzig (q.v.). It is in a lignite-mining dist., and has engineering manufs. Pop. 19,000.

Börne, Karl Ludwig (1786-1837), Ger. political writer and satirist, b. Frankfurt-on-Main, of Jewish parentage. He studied medicine at Berlin. From 1807 he studied constitutional law and political economy at Heidelberg and Giessen. In 1818 he became a convert to Lutheran Protestantism, changing his name from Löb Baruch to Ludwig Börne. From 1818 to 1821 he ed. *Die Wage*, which was suppressed by the police authorities for its anti-gov. views. His views and satirical style are fully developed in his *Briefe aus Paris*, in which he reproaches the Ger. people with every kind of vice and folly. B. d. in Paris of consumption. He was a bitter enemy of Heine (q.v.).

Borneo, third largest is. in the world, in the Greater Sundas group between S.

China and the Sulu Sea (N.) and the Java Sea (S.). Area 287,000 sq. m. Not being volcanic B. is less fertile than the surrounding is. The mountainous interior rises to 13,455 ft in Mt Kinabulu in the N. There are many navigable rivers, most important of which are the Kapuas and Rajang flowing W., and the Barito flowing S. B. is mainly jungle with swampy lowlands in the S. and SW. The climate is hot and humid, with ann.



E.N.A.

A WOMAN AND HER BABY OF THE JUNGLE REGION OF BORNEO

rainfall over 100 in. from the NE. and SE. monsoons. Dense forests produce sandalwood and camphor. Agric. products include rubber, rice, copra, and resin. Mineral resources include oil, iron, copper, diamonds, and coal. Main exports are petroleum products. The pop. (about 3,100,000, including nearly is.) comprises Dyaks (q.v.) in the interior, and Malays, Javanese, and Chinese on the coast. Portuguese and Sp. traders visited B. in the 16th cent., Dutch in the 17th, and Brit. in 1665. Dutch influence was paramount until the estab. of Sarawak (q.v.) in 1841. B. was occupied by the Japanese in the Second World War. It is divided politically into 4 sections: (1) Brit. N. Borneo (29,380 sq. m.); (2) Sarawak (47,000 sq. m.), both Brit. Crown Colonies; (3) Brunei (2226 sq. m.), a Brit.

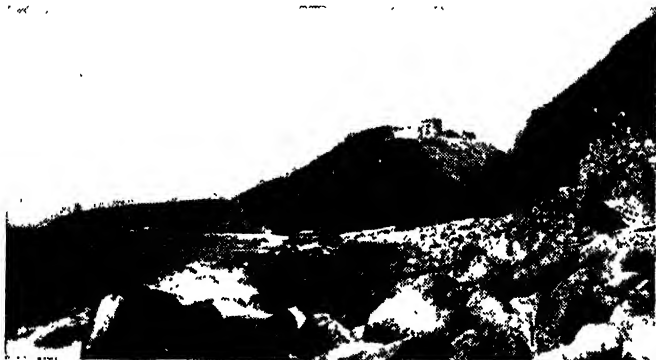
protectorate; and (4) Indonesian Borneo (formerly Dutch Borneo) (208,300 sq. m.).

Borneo, North, ter. at the N. end of the is. of B., area 29,380 sq. m., with a coastline of some 900 m. The pop. of 364,000 consists mainly of settlers on the coast and of aboriginal tribes inland. The Bornean natives number about 250,000 (Dusuns 120,000, Bajaus 45,000, and Muruts 18,000). In addition there are nearly 80,000 Chinese, over 17,000 natives of the Malay Archipelago, and some 1200 Europeans. The E. coast has many valuable rivs. and the chief riv. on the W. is the Padas. Kinabalu Mt. is 13,455 ft. high. The climate is pleasant. Sandakan (14,000) is the best of the 4 excellent harbours. Rubber cultivation, over 120,000 ac., is the chief

rights and assets was left to be settled by arbitration. The Crown was to pay £860,600 on 30 Dec. 1946, out of which sum the company was to redeem outstanding debentures, this sum being regarded as full or part satisfaction of the amount payable under the arbitration (save that whatever that amount, the company would not be called on to repay any part of the £860,600).

See Owen Rutter, *The Pagans of North Borneo*, 1930, and Agnes Keith, *Land below the Wind*, 1939.

Borneo Camphor is obtained from a huge tree, native of Sumatra and Borneo. It is deposited in fissures in the wood, and these fissures have to be opened to obtain it, but it can also be obtained by the action of reducing agents.



Danish Tourist Bureau

BORNHOLM

industry. Other exports include tobacco, manila hemp, copra, cutch, and timber. There is a railway (116 m.) from Jesselton, the cap. (pop. 11,700), on the W. coast to Melapap in the interior, with a branch from Beaufort to Weston on Brunel Bay. The ter. was bought from the sultan of Brunel in 1877 by the Brit. N. Borneo Co., incorporated by royal charter in 1881. A Brit. protectorate was estab. in 1888, and the ter. was administered by a governor responsible to the company's court of directors in London. During the Second World War the ter. was in the occupation of the Japanese from 1941 to 1945. See **PACIFIC FRONT IN THE SECOND WORLD WAR**. After the Second World War it was considered desirable that the Crown, in consideration of compensation to the company, should assume direct responsibility for the gov. of the state of N. B. The agreement for the transfer of sovereign rights to the Crown was concluded on 28 June 1946, on which date Brit. N. B. became a Brit. crown colony (like Sarawak, q.v.). Its name was then changed to N. B. Under the agreement the sum to be paid in respect of sovereign

Bornholm, is. belonging to Denmark, situated about 22 m. SE. of the Swedish coast, in the Baltic Sea. It is 24 m. long, and 16 m. wide; area 225 sq. m. Its coast is very rocky, and the interior is hilly, especially in the N., where the cliffs reach a height of nearly 150 ft. The soil is fertile, and flax, hemp, and oats are grown. There are good pasture lands for cattle. Sev. quarries are in the neighbourhood, from which are obtained building stone, marble, and limestone, also a fine porcelain clay is worked. The industries are weaving, the making of clocks and watches, and earthenware. There are distilleries and breweries. Rønne is the chief tn, and there are a few small tns: Nekse, Hasle, Svanke, Allinge, and Sandvig. B. was captured by the Hanseatic League in 1525, and later passed to Sweden, but returned to Denmark in 1660. In the Second World War the is. was occupied by the Germans and then by the Russians until April 1946. Pop. 48,500.

Borning, or **Boning**, method of making a line or surface level. It is accomplished by looking along 2 or more straight edges

or a range of poles set up at regular intervals.

Bornite, metallic reddish-brown, brittle, copper-iron sulphide (formula Cu_3FeS_3), crystallising in the isometric system. It is named after Ignaz Born (1742-91), an Austrian metallurgist, who is notable for having discovered a method of extracting metals by amalgamation. A freshly fractured surface is copper-red to brown in colour, but soon develops an iridescent tarnish; whence the names *Erubescite* and *variegated copper ore*. Cornish miners have called it *peacock ore*. B. occurs as a primary mineral, but the most important source of this and other copper sulphides are ore bodies, which have been enriched by secondary depositions from overlying minerals of the oxidation zone. Of this type are the important copper deposits of Butte, Montana, U.S.A. B. is also mined in S. Australia, Peru, the Caucasus, Mansfeld, in Germany, and S. and S.-W. Africa.

Bornu, central African dist. W. and S. of Lake Chad. Formerly a Negro kingdom extending to the borders of Egypt, it was first visited by Europeans in 1823. Towards the close of the 19th cent. it was divided between Great Britain, France, and Germany, being included in Nigeria, Fr. W. Africa, and the Cameroons. The Nigerian dist. of B. has an area of 33,650 sq. m., and a pop. of 700,000; its cap. is Maidugari, pop. 57,000. It is a flat country with few elevations. The soil on the whole is fertile, for though water is lacking it can usually be obtained by boring; and the region is said to be capable of great pastoral development. The regions adjoining rivers are formed by alluvial deposits and are very fertile. Climate is hot and unhealthy. Chief products are indigo, cotton, yams, beans, and ground nuts. Pop. consists of various tribes, of which the chief are Kanuri, Kanembu, Tebu, Musgu, Manga, and Hausa. They are mainly Mohammedan Negroes, and trained horsemen.

Borodin, Alexander Porphyrevich (1833-87), Russian composer, b. St Petersburg. He displayed from childhood an equal liking for music and for science. His professional career was that of an expert chemist, but he devoted all his spare time to music. He first came under the influence of Balakirev and, after a period of study, wrote his first symphony—which shows some influence of Schumann, yet is in many respects characteristic of the later B. himself. He then began his opera *Prince Igor*, working at it at irregular intervals. This score, completed by Rimsky-Korsakov and Glazunov, contains some of his finest music. His other works include a second symphony (1877) and a third unfinished symphony; 2 string quartets and a few minor pieces for the same combination of instruments; a dozen songs, some of great originality and beauty; and the orchestral tone-poem *In the Steppes of Central Asia*. B. shows very distinctive melody, not greatly influenced by folk-song, and his harmony has a very individual flavour; also, almost alone among

Russians, he has the gift for utilising simple but remarkably apt polyphonic combinations of these melodies, as exemplified in the tone-poem mentioned above and in the 'Polovtsian Dances' in *Prince Igor*.

Borodin (real name Gruzenberg), Mikhail Markovich (1884-1952), Russian Communist of Jewish origin. Before 1917 he spent many years as an emigrant in America, where he was a member of the Amer. Socialist party. From 1918 he worked as an agent of the Communist International. In Aug. 1922 he was arrested in Glasgow and after 6 months' imprisonment expelled from Britain. In 1923 he was invited by Sun Yat-sen to China, and until 1927 acted as high adviser to the Central Executive Committee of the Kuomintang. He was arrested during the great purge of 1936-7, and d. in a concentration camp.

Borodino, vil. in the Moscow Oblast, 70 m. W. of Moscow. It was the scene of the great but indecisive battle in 1812 between Napoleon and the Russians under Kutuzov. Both sides incurred terrible losses but held their positions. After the battle, however, Kutuzov retreated and surrendered Moscow.

Borojević, von Bojna, Svetozar (1856-1920), Austro-Hungarian soldier, b. Croatia. In the Galician campaign, 1914, he was a general of infantry and distinguished himself at the battle of Komarov. After the fall of Lemberg to the Russians, he was put in command of the Third Army in that sector, but in his ill-starred attempt to capture Przemyśl by frontal attack (Jan.-Feb. 1915) he was no more successful than the general he had superseded. This campaign having developed into the Carpathian battle with a serious Russian threat to the plains of Hungary, it was left to B. with the very effective help of von Mackensen to turn the tide, and Lemberg was recovered soon after the Russians had been repelled from the Carpathians. In 1917 B., now promoted to be Commander-in-Chief of the Austro-Hungarian armies on the Isonzo front, again attacked in concert with a Ger. army on his wing, his coadjutor this time being Otto von Below. The breakthrough was accomplished, but the Austrian armies under B. lacked staying power. B.'s First and Second Isonzo armies did eventually reach the Piave, but in June 1918 he was involved in the failure of the final and disastrous Austro-Hungarian offensive. His memoirs were pub. in 1921. He d. at Klagenfurt.

Boroglyceride, mixture of boric acid with glycerol.

Boroimhe, see BRIAN.

Borolanite, geological name of igneous rock occurring near Loch Borolan in the Scottish highlands. A form of syenite.

Boron, non-metallic chemical element. It occurs in nature in the form of boric acid and its salts. The element when separated appears as a brown powder, which burns to form the trioxide B_2O_3 . When heated with sulphuric acid it oxidises to boric acid. It combines directly with fluorine on contact, and with chlorine

and bromine on heating. The chloride is a colourless fuming liquid which readily decomposes in the presence of water, and the bromide has much the same properties. The sulphide also can be formed by direct union of the 2 elements on heating, and is also rapidly decomposed by water.

Bororo, tribe of Amer. Indians of the Amazon, Brazil. Hunters and gatherers, they trace descent on the mother's side (matriline, q.v.). They have elaborate mortuary rites. See R. H. Lowie, 'The Bororo,' in J. H. Steward's *Handbook of South American Indians* (vol. i), 1946, and C. Levi-Strauss, *Tristes Tropiques*, 1956.

Borough (Burrows, Borrows), Stephen (1525-84), Eng. navigator; went on the expedition under Willoughby from the Thames to find a N. passage to Cathay and India, 1553, this being the first voyage of the English to Russia. B. was master of the *Edward Bonaventure*, with Chancellor as chief pilot. Separated by storms from the other 2 vessels, he sailed on into the White Sea, being first to find and name N. Cape. In a second expedition in the *Serchthrift*, 1556, he discovered Kara Straits between Novaya Zemlya and Vaygach Is. Probably about 1558 he went to Spain, and was the first to propose a trans. of Cortés's work, known in England as Eden's *Arte of Navigation*, 1561. B. went on another expedition to Russia in 1560, 'the seventh voyage of the Merchant adventurers to Moscow' (Hakluyt). In 1563 he was chief pilot and one of the 4 masters of the queen's ships in the Medway. Some of his records of his voyages appeared in Hakluyt.

Borough, William (1536-99), Eng. navigator and author, brother of Stephen B. (q.v.). He was an ordinary seaman on the *Edward Bonaventure* on the first voyage to Russia, 1553. Afterwards he made many voyages to St. Nicholas. Later he transferred his services from the merchant adventurers to the Crown, but the actual dates are uncertain. In 1570 B. fought against pirates in the Gulf of Finland. Commanding the *Lion*, he accompanied Drake in the Cadiz expedition, 1587; but got into trouble for questioning the wisdom of the attack on Lagos. He commanded the *Bonavolia* in the Armada fight, 1588. B. is author of *Instructions for Discovery of Cathay Eastwards for Pei and Jackman*, 1580, and of *A Discourse of the Variation of the Compass*, 1581. Some of his charts are preserved at the Brit. Museum and at Hatfield.

Borough, The, see SOUTHWARK.

Borough. The word B. is derived from O.E. *burg*, meaning a walled or fortified place. Such places comprised the fortress-girded metropolis of each component kingdom of the heptarchy in Britain, walled seaports, border fortresses, and fortified *tuns*, or townships, on the royal demesne. The genesis of the *burg* is not to be sought in any Rom. source, and all the evidence at hand goes to show that the development of Eng. B.s is exclusively related to the peculiar conditions

of our national life. It is true that the Rom. *coloniae* and *municipia* reveal in some sort the idea of self-gov., but the powerful central organisation of the imperial gov. of auct. Rome and its military spirit were inconsistent with any true conception of local gov. In Britain, when the great fiefs or feudal baronies became hereditary, any local power that might have existed became absorbed in the privileges of the great barons. Thereafter burghal life in England is a slow growth originating in charters of incorporation or grants of liberties, comprising privileges rooted in custom, bought of the overlord or king at a heavy price in money and developed through the powerful organisation of merchant and craft guilds. Finally, the term B. becomes almost synonymous with the statutory creation of the 'municipal B.', denoting a place to which certain wide powers of self-gov. are accorded and exercised through the characteristic hierarchy of mayor, aldermen, and burgesses. The *township*, the smallest unit in the political system, consisted merely of a group of allodial landowners and held together by a community of interests, undoubtedly contained the germ of many of our B.s. Others grew out of a collection of such townships, and most of the remainder had their beginnings in the neighbourhood of some castle or under the walls of the monasteries. The chief magistrate of the *burg* was the *town-reeve*, or, in ports, the *port-reeve*. The men of the *burg* met together both for the purposes of commerce and defence, and by a system of mutual pledges (called *frankpledge*) answered for the good behaviour of every man in the *burg*, the paramount ownership of the great feudal lords being preserved by their power to appoint the reeve and the exaction of an arbitrary tallage. The king's supreme ownership was secured through the jurisdiction of the hundred, from which the *burgs* soon obtained exemption, and the shire-gemot, to which they remained more or less subject until the evolution of that body into the co. council and co. court of to-day. Even before the Conquest a few big tns had acquired the privilege of compounding for the arbitrary taxes or tallages of the king's sheriff by paying a fixed rent.

After the Conquest B.s or tns became divided into those which were included in the royal demesne and those which were held by barons, and soon rose into greater importance through the grant by the king or overlord (as the case might be) of charters of incorporation and privileges. These privileges generally comprised a right of independent jurisdiction, self-assessment, the right to have a *hanse*, or merchant guild, the free election of reeves, *infangentheof*, or local jurisdiction, over thieves, exemption from tolls, and the commutation of the profits of fairs and markets and the arbitrary assessments by the sheriff of individual burgesses (q.v.) for a perpetual fixed rent from the whole B., called the *firma burgi*. Those contributing towards the *firma*

burgi were said to hold their tenements by burgrave tenure. By the time of Henry III most of the large tns had obtained a distinct recognition by the king of their privileges and immunities. Charters were granted to the 'fully qualified members of the township,' and from having no powers of self-gov., B.s soon became especially adapted through the organisation of the guild system, to the functions of municipal gov. Separate jurisdictions, and the obligations of feudal tenures which bound so many of the burgesses to some paramount tenant-in-capite, or great baron, disappear after incorporation, and the substitution of the *mayor* for the *reeve* heralds the advent of an independent local community. The municipal gov. of B.s from and after the grants of incorporation by the Plantagenets was developed partly by the possession of corporate property, but arose chiefly from the spirit of corporate unity and mutual responsibility that permeated the *guilds*. When B.s become recognised by the Crown, their by-laws (*burg-laws*) acquire a binding force. Later, in the reign of Edward III, the powers of the merchant guilds are absorbed by the *craft guilds*, or guilds of craftsmen engaged in a particular craft in a particular B. Ultimately the place of the craft guilds is taken by the merchant companies of the 17th cent., and the powers of self-gov. revert to the close corporation of the B. composed of the mayor, aldermen, and councillors. From the middle of the 13th cent. the general tendency in the development of B.s is to vest the governing powers in a mayor chosen by the whole body of burgesses, a group of aldermen, and a larger body of councillors. The aldermen and councillors, who soon acquired the power to elect the mayor themselves, united themselves into a close corporation, and managed to get charters of incorporation granted to themselves to the exclusion of their fellow burgesses. This restrictive tendency increased, and after the close of the 15th cent. freemen were excluded by the close corporation from elections, and the corporation assumed the ownership of the B. property and even controlled the election of members of Parliament, a power which was found especially useful to an end with the passing of the Municipal Corporations Act of 1835. That Act, which introduced the term 'municipal B.,' reformed the larger corporations and gave new powers of self-gov. to such places, whether parl. B.s or not, as were deemed 'municipal B.s.' In connection with parl. representation, constitutional historians observe that the word B. becomes for a time associated with a place, whether incorporated or not, which usually returned a member to Parliament. Where the B. had no charter, that distinctive feature of B.s was preserved by the assumption that every parl. B. must have had a charter at some former time, or was entitled to the privileges of incorporation by prescription (usage). The Reform Act, by disfranchising the rotten

B.s (see ROTTEN BOROUGH), restored the meaning of B. to its previous signification. A B. now means a tn or place subject to the Municipal Corporation Act, 1882, and its amendments (see LOCAL GOVERNMENT ACT, 1933). The Crown still retains the prerogative of incorporating B.s by royal charter. A B. possesses a common seal and a council consisting of a mayor, aldermen, and councillors. The councillors are elected by the local government electors and the mayor and aldermen by the councillors. The mayor is an *ex officio* magistrate for the B., and sometimes receives a salary. The mayor serves 1 year, the councillors 3 years, and the aldermen 6 years, one-half of the aldermen retiring every 3 years. B.s of over 75,000 inhab. can be turned into administrative cos. by private Act of Parliament, and are not then under the power of the co. council. The Local Government Act, 1888, converted a number of these large B.s into administrative cos. Some B.s have a court of quarter session, presided over by a judicial officer called a recorder. A B. is controlled by the central gov., but the sanction of the Ministry of Housing and Local Gov. is required for loans secured on the B. rates, and the property of the B. may not be alienated without the consent of the Crown. A B. possesses wide powers of making bylaws for the good rule and gov. of the B. As to the qualification of a burgess, see *BURGESS*. The word burgh as used now is appropriated to Scotch B.s or burrows, as to which see *BURGH*. See also *LOCAL GOVERNMENT*.

Borough English, custom, formerly existing in many cities and ancient boroughs of England, by which lands and tenements held in ancient burgrave descended to the youngest son instead of to the eldest.

Boroughbridge, par. and mkt tn of Yorks (W. Riding), England, on the R. Ure, 6 m. SSE. of Ripon. Aldborough (q.v.) is $\frac{1}{2}$ m. E. Pop. 1000.

Borrera, named after Wm Borrer (1781-1862), an eminent Brit. cryptogamic botanist. It is a genus of lichens, containing species which grow on trees or the ground, and are branched, bushy, or tufted little plants, one species farinaceous. Sev. are British.

Borreria, genus of Cinchonads, of which one species, *Borreria ferruginea* and *B. podya*, both from Brazil, yield a bastard ipecacuanha.

Borris, vil. of co. Carlow, Rep. of Ireland, at the foot of the Blackstairs Mts. Pop. 500.

Borromeo Islands, group of 4 is. in Lake Maggiore (q.v.), Italy. The largest, Isola Madre, has a palace and a park with exotic plants. Isola Bella is famous for its magnificent unfinished palace of the Borromeo family and its beautiful terraced gardens. Isola dei Pescatori (or Superiore) has a fishing vil. The 4th is. is Isola Giovanni. Total pop. about 300.

Borromeo, Carlo, St (1538-84), It. cardinal, son of Ghiberto B., Count of

Arona, and Margarita de' Medici, b. at the castle of Arona, on Lake Maggiore. He studied civil and canon law at Pavia, taking his doctor's degree in 1559. When his uncle became Pope as Pius IV, B. was made protonotary, created cardinal deacon, and raised to the Archbishopric of Milan. He founded an academy of learned persons, and pub. their memoirs as the *Noctes Vaticanæ*. On the death of Pius IV, Carlo began the reformation of his diocese. Sev. religious orders opposed him in these reforms, the most vigorous being that of the Brothers of Humility. A plot to assassinate him was formed by this society, and he only escaped death by a miracle. During the plague at Milan in 1576 he helped the sick, buried the dead, distributed money, and avoided no danger for the sake of the suffering. Canonised in 1610, his feast is on 4 Nov. Besides the *Noctes Vaticanæ* he pub. many homilies, discourses, and sermons.

Borromeo, Federico (1564-1631), It. archbishop, nephew of Carlo B. (q.v.). He was made cardinal in 1587, and Archbishop of Milan in 1595. His noble life is commemorated in Manzoni's *I Promessi Sposi*, 1826. He was the founder of the Ambrosian library, for which he collected 9000 MSS.

Borromini, Francesco (1599-1667), It. architect, b. Bissone; chief representative of the baroque style. Prin. works are the churches of S. Carlo alle Quattro Fontane, St Agnese (except the *campanile*), S. Ivo alla Sapienza, and S. Filippo Neri; and the Falconieri Palace—all in Rome.

Borron, Robert de, Fr. poet of the 12th cent. He wrote a Graal romance in octosyllabic couplets, *Joseph d'Arimathie* (c. 1180-99), one of the earliest works, if not the first, concerning the Holy Grail. He also wrote a poem on Merlin, based on Geoffrey of Monmouth or Wace, which survives for the most part only in a prose version. B.'s poems are not of exceptional value, but their influence on the Arthurian prose romances was immense. See J. D. Bruce, *The Evolution of Arthurian Romance* (2nd ed.), 1928.

Borrow, George Henry (1803-81), philologist and author, b. E. Dereham, Norfolk. In *Lavengro* he tells us that he was of Cornish descent on his father's side, while his mother was a Huguenot. He speaks of himself as being a very backward boy. In Norwich, where his parents came to live when he was 17, he was articled to a solicitor. Here his philological tastes were encouraged. He studied Welsh, and learnt to read and appreciate the works of Dafydd ap Gwilym (q.v.). On the death of his father, in 1824, he went to London and became a hack writer in the firm of Sir Richard Phillips, who was undoubtedly the original of the vegetarian publisher in *Lavengro*. In 1825 appeared his first work, *Faustus: a Translation from the German*, and in the next year a miscellany from the Danish. In 1826 also appeared his *Romantic Ballads*. The chalus of London galled him, however, and in that year he threw them off

to wander through the country as tinker, gipsy, ostler, or whatever offered, walking through the Eng. countryside, consorting with those who, like himself, felt the call of the wild. Later he extended his travels to the Continent, walking through parts of France, Austria, Italy, and Russia, where from 1833 to 1835 he superintended the trans. of the N.T. into Manchu, the court language of China. In 1835 he pub. his *Targum*, a collection of trans. from 30 languages and dialects.



National Portrait Gallery

GEORGE HENRY BORROW

Returning to England, he accepted the somewhat unlikely position of an agent to the Bible Society, and travelled through Spain, Portugal, and Morocco from 1835 to 1839, his adventures being admirably described in his work *The Bible in Spain*. In 1840 he married Mrs Clarke, a Norfolk lady, and settled down to a life of literary labour on her estate at Oulton Broad. To the estate he welcomed his old friends the gipsies, and it became for them a regular camping-ground. There he passed the remainder of his life.

In 1841 he had pub. *Zincali, or The Gypsies in Spain*, followed in 1843 by *The Bible in Spain*. The first, by its extraordinary knowledge of a mysterious race, and the second, by its wonderful pictures of the country, took the reading world by storm, and placed B. in the foremost rank of living writers. His popularity was too great to last. *Lavengro*, 1851, and *The Romany Rye*, 1857, its sequel, came far below the expectations aroused by the earlier work. It was not that the author was at fault, but that he did not write to suit his public. *Lavengro* is undoubtedly

greater than the earlier books, even if *The Romany Rye* is weaker. His later books were certainly weaker than his earlier; *The Sleeping Bard*, 1860, trans. from the Welsh, did not awaken much interest; *Wild Wales*, 1862, is lacking in the romantic flights which characterise the earlier work; and *Romano Lavo-ll*, 1874, a glossary of gipsy words and phrases, is curious, but not inspired. His last 2 books were *The Turkish Jester*, 1884, and *The Death of Balder* (trans. from the Danish of Ewald), 1889. See H. Jenkins, *Life of George Borrow*, 1912; E. A. Thomas, *George Borrow: the Man and his Books*, 1912; C. K. Shorter, *George Borrow and his Circle*, 1913; S. Dearden, *The Gipsy Gentleman*, 1939; B. Vesey-FitzGerald, *Gypsy Borrow*, 1953.

Borrowdale, Cumberland, the upper valley of the Derwent (q.v.), ascending in a S. direction from Grange, via Rothwaite, Seatoller, and Senthwaite to Esk Hause, 2490 ft, in the heart of the Lake Dist. (q.v.) mts. The upper reach of B. is dominated on the right by Great Gable (q.v.), to which there is an easy path, the rock climbs being on the far side, and on the left by Glaramara, 2560 ft. The Derwent rises in Sprinkling Tarn below Esk Hause. B. formerly possessed rich plumbago mines, exhausted in 1868.

Borrowing Days, or Borrowed Days, the last 3 days of Mar., popularly supposed, according to Scottish legend, to have been borrowed from April. The deed is thus told in quaint verse:

March borrowit from Averill
Three days and they were ill.

The rhyme, however, is not peculiar to Scotland. See Kenneth Richmond's *Poetry and the People*, 1947, p. 199: 'that verse which, in one form or another, turns up in . . . every county:

March borrowed from Averill
Three days and they were ill.

The one was sleet and the other was snow
and the third was the worst that e'er did blow.'

Borrows, S., see BOROUGH, STEPHEN.

Borrowstounness, see BO'NESS.

Borsa, tn of Rumania, in the prov. of Baia Mare. It is noted for its mineral springs. Pop. (1930) 1500.

Borsec, vil. in Bacău prov., Rumania, 95 m. E. by N. of Chuj. It is situated in the Carpathian valley, at a height of 2400 ft above the sea, and is celebrated for its mineral waters.

Borsippa, anct Babylonian city **Barsippa**, mod. **Birs Nimrud**, 7 m. SW. of Babylon. B. fl. c. 1200-50 bc as a centre of religious learning and of the worship of Nabu, god of astronomy, writing, and science. The vitrified ruins of the 7 stage *ziggurat* rebuilt by Nebuchadnezzar II, named *Euriminnanki* ('Tower of the 7 planets'), have been considered by some to be the biblical tower of Babel. Arab tradition says that here Nimrod tried to cast Abraham into a fiery furnace. Numerous expeditions to B., notably those by Layard, Rawlinson, Rassam, and Koldey, have unearthed buildings and inscriptions.

Borsod-Abauj-Zemplén County, see MISKOLC.

Borstal Training. From the point of view of his trial, the adolescent offender of 17 upwards is regarded as a full adult, but there are certain restrictions on imprisonment of those under 21 (see CRIMINAL LAW) and certain special forms of treatment, namely the detention centre (see CRIMINAL LAW), of which there are at present (1956) only 2, and the system of B. T. The inception of the Borstal system dates from 1902 when a modified form of prison treatment for this age group was introduced at Borstal prison, near Rochester. In 1908, under the Prevention of Crime Act, Borstal detention became a recognised part of the penal system, separated from the prison system, though the Borstal institutes remained under the control of the Prison Commission. From their inception the Borstal institutes concentrated on training. Under the Criminal Justice Act, 1948, the name has been changed from Borstal detention to B. T., a change which is significant of the point of view behind the system.

Anyone aged 16-21 convicted of an offence punishable in an adult by imprisonment can be sent to Borstal by the Assizes or Quarter Sessions or recommended to Quarter Sessions for Borstal by a summary court if the court is satisfied 'that it is expedient for his reformation and the prevention of crime.' Adolescents from approved schools (q.v.) aged 16 and over can be committed to Borstal directly by summary courts.

Borstal sentences could originally be for 2 or 3 years. They are now always for 4 years of which not more than 3 years can be spent in a Borstal institution. The period of detention is followed by a period of release on licence which continues until the end of the 4-year sentence whatever the date of release. During this time the offender is placed under supervision, generally of a probation officer, and can be recalled at any time if his behaviour is unsatisfactory. The average period of detention is between 20 and 21 months.

There were in 1955 14 training estab. for boys of which 9 were open, 4 closed, and 1 of medium security. In addition there are 1 recall centre, 1 corrective estab. for those who persistently misbehave, and 2 reception centres dealing with allocation. For girls there is 1 open and 1 closed training institution, the latter acting also as the allocation centre. Recall cases are sent to a wing of Exeter prison. In 1954, 1522 boys were committed to Borstal, and 130 girls. The Borstal institutions for boys vary considerably, not only because some are open and some closed, but also in respect of the type of technical training given and the type of boy for whom they are intended, e.g. the immature and deprived boys are sent to different institutions from the tougher type. This demands careful allocation which is carried out at the reception centre where a most thorough system of observation and testing has been built up.

The Borstal institutions for boys are mostly large. Only 1 takes less than 100 and Portland, the largest, can accommodate over 370. The open Borstal for girls at East Sutton takes over 50, but the closed Borstal at Aylesbury has an average pop. of about 165. The training given at the Borstal institutions is based on an individual approach which is impossible with these large numbers. Hence the Borstal institutions are divided into 'houses,' though even so this basic unit is often too large for its purpose owing to shortage of staff. The house system is also valuable as helping to establish a corporate sense. Both smaller Borstal institutions and smaller houses would be welcomed by the Borstal authorities themselves. The prison commissioners are planning 2 new closed Borstal institutions both of which would take only 50.

Technical training, whether industrial or agric., plays a large part and includes trade courses recognised by the Ministry of Labour. The boys at Usk Borstal are occupied in afforestation and at the N. Sea Camp in land reclamation. On the side of character training the aim is to build up a sense of responsibility and to teach self-discipline, rather than mere conformity to rule. The particular needs and difficulties of each inmate are taken into account, and the aim is to avoid rigidity in the handling of the individual.

Though the purpose of the Borstal system is training rather than punishment, it is important to recognise that the long Borstal sentence seems, to the boys and girls who receive it, far more punitive than a short prison sentence. In so far as the fear of punishment has a deterrent effect, a Borstal sentence is likely to rouse more fear than a prison sentence.

Before the war Borstal claimed 75 per cent success for boys and 70 per cent for girls. These figures covered a 7-year period after release. During the war the Borstal system was seriously affected by the loss of staff—a large proportion being young—so that during the early post-war years the staff was largely inexperienced and was still short in numbers whilst the Borstal pop. rose rapidly. It is doubtless primarily as a result of this situation that the success rate for boys fell to 65 per cent. The girls' Borstal institutions now claim 90 per cent success.

A recent study of Borstal results shows that the results from the open Borstal institutions are better than from the closed, even when the chances of success estimated on the basis of the boy's character and previous records appear to be the same. (See reference to prediction table under PENOLOGY.)

Bibliography. W. Healy and B. S. Alper, *Criminal Youth and the Borstal System*, 1941; W. A. Elkin and Rev. D. B. Kittermaster, *Borstal: A Critical Survey*, 1950; G. Rose, *500 Borstal Boys*, 1954; Dr H. Mannheim and L. Wilkins, *Prediction Methods in Relation to Borstal Training*, 1955; W. A. Elkin, *English Penal System*, 1957.

Borthwick Castle, E. Midlothian, Scotland, 13½ m. SSE. of Edinburgh, founded in 1430. In June 1567 Mary Queen of Scots and Bothwell stayed here after their marriage. It was restored (1890–1913) as a private residence, and during the Second World War was used as a safe-deposit for Scotland's national art treasures. The historian Robertson was b. at the manse close by.

Bort-les-Organes, Fr. tn in the dept of Corrèze, on the Dordogne, at the foot of vast basalt colonnades—the so-called 'Organs of B.' There is a hydro-electric station, and textile and leather manufs. Pop. 5100.

Boru, see BRIAN.

Borujerd, dist. and tn of Persia, 100 m. E. of Kermanshah. It produces wheat, cotton, pulses, tobacco, sugar-beet, and fruit, and is a centre for carpet-weaving. Pop. of tn 46,000.

Boryslaw, see BORISLAV.

Borysthenes, anc. name for the Dniester R. (q.v.).

Borzhom, tn in (Georgia, on R. Kura, 93 m. W. of Tiflis. It is a watering-place with a fine climate, and the centre of sev. health resorts; its mineral waters are sold throughout Russia. Pop. (1917) 3500.



T. Fall

Borzoi, or Russian Wolfhound, dog of the greyhound type, which is found to endure cold and travel rapidly over snow. It is light and slender of build, has warm, silky hair and large hairy feet; its swiftness is remarkable, and it is therefore much used in wolf-hunting. The tsars of Russia for a long time kept special kennels of these hounds, and the first pair seen in England was given to the Prince of Wales by the tsar in 1870. B.s hunt in couples, catching the wolf up very speedily, when one attacks it on each side, holding it until the huntsman rides up to dispatch it. When not engaged in hunting, the hound is good-tempered, obedient, and intelligent. In colour it is usually white, but black, tan, and yellow patches are frequently to be seen. In appearance it is graceful, with a long, narrow skull, long and powerful neck and body, slender legs, deep chest, flat sides, and a profuse and silky coat. The

average height of the male is 28 to 33 in., and of the female 26 to 30 in.

Bos, Lambert (1680-1717), Dutch scholar and critic, b. Workum in Friesland; educ. at the univ. of Franeker, where he became Gk prof. in 1704 and spent the rest of his life. His works include notes on Thomas Magister (q.v.), 1698, *Ecclesiastes Philologicae*, 1700, *Ellipses Graecae*, 1702, trans. into English by John Seager in 1830, *Vetus Testamentum ex Versione LXX. Interpretum*, 1709, *Antiquitates Graecae*, 1714, and *Animadversiones ad Scriptores quorundam Graecorum*, 1715.

Bos, see **Ox**.

Bos (fossil), oxen family, occurs in a fossil state in the superficial deposits of Europe and America. *B. primigenius* is found in the Pleistocene in Essex and Wilts; *B. longifrons* in Ireland is a smaller species.

Bosa, tn in Sardinia (q.v.), 30 m. S. by W. of Sassari (q.v.). It has an ancient castle, and 2 notable churches. There is a coral fishery. Pop. 7500.

Bosanquet, Bernard (1848-1923), philosopher. He was a scholar of Balliol College, Oxford, and lecturer (1871-81) at Univ. College, Oxford. As a philosopher he was a follower of Hegel, whose *Aesthetics* he trans., and a disciple of T. H. Green. Works include (1885-99) *History of Aesthetics, Knowledge and Reality, Essentials of Logic, Psychology of Moral Self*, and the *Philosophical Theory of the State*.

Bosanski Brod, see **SLAVONSKI BROD**.

Bosboom, Anna Louisa Geertruida Tonsaint (1812-86), Dutch novelist, b. Alkmaar. During her early life she spent sev. years in historical research, of which she made good use later for her novels. In 1851 she married Jan B., the painter. Her works, many of them stories of Dutch hist., are true representations of the manners and customs of the people. Among these works are *Almagro*, 1837; *Engelschen te Rome* (The English at Rome), 1839; *Het Huis Lauernesse* (an episode of the Reformation), 1841, which was trans. into sev. languages; and the 3 stories of the Leicester family: *De Graaf van Leicester in Nederland*, 1846, *Vrouwen van het Leycestersche Tijdvak*, 1845, and *Gideon Florensz*, 1854. She was also successful with the modern character novel, as *Majoor Frans*, 1874. Her stories are remarkable for their historical and psychological insight. Her collected works were pub. in 25 vols., 1880-8. See J. M. C. Bouvy, *Idee en Werkwijze van Mevr. Bosboom-Tonsaint*, 1935.

Boscán Almaguer, Juan (c. 1490-1542), Sp. poet, b. Barcelona, of an ancient noble family. He came to Granada to the court of Charles V in 1516. He was afterwards entrusted with the education of the Duke of Alva. He passed some years in military service. His poems were pub. by his widow at Barcelona in 1543. They are divided into 4 books. The first contains light poems in the old Castilian metres. The second and third books consist of a number of poems in lt. metre, sonnets, *canzoni*, and poems in blank verse. *Hero and Leander* is the longest

of these. The fourth book contains his best effort, *The Allegory*. He pub. in 1534 a trans. of Castiglione's *Cortegiano*. His friendship with Garcilaso de la Vega (q.v.) bore fruit in popularising lt. verse forms. See M. de Riquer, *Juan Boscán y su cancionero barcelonés*, 1945.

Boscawen, vil. on the N. coast of Cornwall, England, 6 m. from Camelford. It is a popular holiday resort, has a sheltered harbour, and is surrounded by impressive scenery. Pop. 600.

Boscawen, Sir Edward (1711-61), Eng. admiral, third son of Hugh, 1st Viscount Falmouth. He became a lieutenant in 1732, served at Porto Bello, 1739-40; Cartagena, 1741; commanded a small squadron in Soundings, 1746; wounded off Finisterre, 1747; appointed Commander-in-Chief by land and sea in E. Indies in 1747, and later in the Mediterranean. Unsuccessfully attempted to reduce Pondicherry. He was nominally member of Parliament for Truro after 1741. He was Lord Commissioner of the Admiralty, 1751-61; vice-admiral, 1755. He commanded on N. Amer. station, in the Channel, off Brest, and in Bay of Biscay at intervals between 1755 and 1757; Commander-in-Chief of fleet at siege of Louisburg, 1758; privy councillor, 1759. His crowning feat was the destruction of the Fr. fleet in Lagos Bay on 18 Aug. 1759. When he died he was holding the post of general of marines. B. was nicknamed 'Old Dreadnought.'

Bosch, Jerome (c. 1462-1516), Dutch painter (so named from his bp. s'Hertogenbosch, Holland, his true name being van Aeken), but as an artist usually considered with the Flemish School. From his choice of subjects he resembles Brueghel, whose art is said to have been largely founded on that of B. B. is in fact one of the most original artists of his age, though he was long forgotten and has only been reappraised in the light of modern Surrealism. His subjects are chiefly satirical, fantastic, or grotesque. He was patronised by Philip II of Spain, and sev. of his prin. pictures are in Madrid, notably 'The Hay Wain' of the Escorial and his extraordinary vision of an 'Earthly Paradise' (Prado). Among his other paintings are 'St Jerome in the Desert,' 'St Anthony,' 'The Last Judgment,' 'Adoration of the Magi,' 'The Fall of the Rebellious Angels.' See J. Combe, *Hieronymus Bosch*, 1948.

Bosch, Johannes van Den, Count (1780-1844), Dutch gen. and administrator, b. Gelderland. He went to Java in 1797, rising to be governor-general of the Netherlands E. Indies in 1828. He was responsible for much of the early development of these Dutch colonies. From 1833 to 1839 he was colonial secretary, and was created count in 1842.

Bosch, Karl (1874-1940), Ger. chemist. He adapted the Haber process for synthesis of ammonia to commercial production, and became chairman of important dye works. He is credited with the discovery of a number of chemical substitutes which relieved shortage in Germany during the First World War.

He was awarded the Nobel prize for chem., 1931.

Bosch Vaark, common bush-pig (*Potamochoerus porcus koiriplamus*) of the Boers. It closely resembles the type found in Madagascar, the sole indigenous representative of the Artiodactyla in that is. The B. V. is found in E. and S. Africa.

Boscobel, par. in Shropshire, England, 22 m. E. by S. of Shrewsbury. B. Manor was the retreat, after the battle of Worcester, 1651, of Charles II who hid in an oak-tree to escape his pursuers.

supra to sun-spots), 1736, in which is to be found the earliest geometrical solution of the problem of the equator of a planet determined by 3 observations. In 1758 his famous work on the molecular theory of matter, *Theoria philosophiae naturalis redacta ad unicam legem virium in natura existentium*, *De solis ac lunae defectibus*, 1760, is an excellent Lat. poem on eclipses.

Bose, Sir Jagadis Chandra (1858-1937), Indian naturalist; educ. in Calcutta and at Christ's College, Cambridge. He was appointed prof. of physical science at



BOSCASTLE

Youttons

Boscombe, sea-coast suburb of Bournemouth, Hants, England.

Bosovich, Roger Joseph (1701 or 1711-1747), It. mathematician and astronomer, b. Ragusa. He entered the Society of Jesus. He was appointed teacher of mathematics and philosophy in the Collegium Romanum at Rome. His reputation was previously made by the solution of the problem to find the sun's equator and fix the time of its rotation by observing the spots. He was sent to London in 1760 to defend the interests of Ragusa. In 1764 he was appointed to a professorship at Pavia, and subsequently at Milan. After the suppression of the Jesuits in 1773 he went to Paris, was given a pension by the king, and appointed director of optics to the navy. Afterwards returned to Milan where he gradually became insane. He did much research on optics, especially on the theory of achromatic spectacles. He left more than 70 works on astronomy, physics, optics, etc., the prin. being *De Maculis solaribus* (see reference

Presidency College, Calcutta, in 1885, became emeritus prof. in 1915, and then founded and directed the B. Research Institute in Calcutta. He became one of the greatest authorities on plant life. In the course of his investigations he invented many delicate recording instruments, one of the most notable of which is the crescograph. In nature the movement of plant tissues may be so minute as to defy the human eye. With the crescograph this movement can be magnified 10,000,000 times and the reactions of plants may thus be studied when manures, poisons, or other stimulants are applied. Among his numerous books are *Plant Response*, *Irritability of Plants*, *Life Movements in Plants*, and *The Nervous Mechanism of Plants*.

Bose, Subhas Chandra (1897-1945), Indian politician. He was an ardent nationalist, and a supporter of Gandhi. In 1920 he joined the Swaraj party, and from 1929 to 1931 was president of the All-India Trades Union Congress. In

1939 he became president of the Indian National Congress. During the Second World War he went into hiding and escaped from India, eventually making his way to Japan. From there he announced his intention of leading an Indian National Army to drive the British from India. He was killed in Japan in an air crash.

Bosio, François Joseph, Baron (1769-1845), It.-Fr. sculptor, b. Monaco. He was brought up and constantly lived in France, where he was a favourite with Napoleon I. He became famous on account of the bas-reliefs he executed for the column in the Place Vendôme. Louis XVIII and the succeeding kings of France employed him in many public works. He was created baron by Charles X.

Boskovice, Czechoslovak in in the region of Bruo (q.v.), with coal-mines and chemical works. Pop. 5000.

Bosna, see SAVA.

Bosna, riv. of Yugoslavia. It rises S. of Sarajevo, and flows N. to join the Sava. Length 160 m.

Bosna-Serai, see SARAJEVO.

Bosnia, N. part of the rep. of Bosnia-Hercegovina, Yugoslavia; roughly the dist. bounded by the Sava (q.v.) and its tribs, the Drina and Una. It is very mountainous, and its mountain ranges, belonging to the Dinaric Alps (q.v.), are thickly wooded. The climate is Alpine. Sarajevo (q.v.) is the prin. tn. Area 16,240 sq. m. *See also BOSNIA-HERCEGOVINA.*

Bosnia-Hercegovina, constituent rep. of Yugoslavia, bordered on the N., NW., and SW. by Croatia, and on the E. by Serbia. It is composed of the 2 anc't provs. of Bosnia and Hercegovina (qq.v.). The early hist. of these provs. is the hist. of Illyria (q.v.). After the break-up of the Rom. Empire the region was contended for by the Hungarians and the Byzantines, and it became to all intents and purposes Hungarian ter. in the 13th cent. In 1325 Bosnia annexed Hercegovina, and an independent kingdom was formed. This fell to the Turks in the 15th cent., and remained under the overlordship of the Muslims for 400 years. In 1875 there was an uprising of the Christians in B.-H., who were supported in the following year by the Serbs and the Montenegrins. In 1877 Russia, as protector of the Slavs, declared war on Turkey (*see TURKEY, History*), and in 1878 Bosnia and Hercegovina were handed over to the military occupation of Austria (*see BERLIN, CONGRESS AND TREATY OF*). Under Austrian administration considerable improvements were made in the condition of the people of the region. In 1908, fearing that the 'Young Turk' reforms might lead to a strengthening of Turkey's position, and taking advantage of Russia's weakness, Austria formally annexed the provs., at the same time as Bulgaria declared itself free of Turkish suzerainty. The Austrian move was supported by the Croats on religious grounds, but was opposed by the Serbs, who considered that the region belonged to them for ethnic and

historic reasons. The murder of the Austrian Archduke Francis Ferdinand (q.v.) at Sarajevo in June 1914, by a Bosnian student, was the incident which led to the Austrian declaration of war against Serbia (*see WORLD WAR, FIRST*). After the subsequent collapse of the Austrian empire, and the end of the war, Bosnia and Hercegovina were incorporated in the new kingdom of the Serbs, Croats, and Slovenes—later Yugoslavia.

The rep. of B.-H. is largely agric. Livestock is raised, and cereals, fruit, vines, and tobacco are grown. Some coal and iron are mined, there are numerous spas, and there is a growing tourist industry. The prin. tns are Sarajevo (the cap.), Banja Luka, Mostar, Tuzla, and Zenica (qq.v.). Area 19,809 sq. m.; pop. 2,843,500. *See also YUGOSLAVIA.* *See Sir A. J. Evans, Through Bosnia and Hercegovina on Foot, 1876; W. H. Chadburn, My Balkan Tour, 1911; R. W. Seton Watson, The Role of Bosnia in International Politics, 1931; B. Schmitt, The Annexation of Bosnia, 1937.*

Bosphorus, or Bosporus: 1. (Gk name for the strait leading from the Black Sea to the Sea of Azov. Called also Cimmerian B. (*Strait of Kerch*). Panticapaeum, on the European side, was the cap. of the Bosporan Kingdom (q.v.).

2. Now **Karadenizli Bogazi.** The word is derived from the Greek denoting Oxford. The legend is that Io, daughter of Inachus, crossed the Thracian B. in the form of a cow. This strait unites the Black Sea with the Sea of Marmora, and forms part of the boundary between Europe and Asia. The channel is 18 m. long, and has a depth varying from 20 to 66 fathoms. Its minimum width is 2½ m. It is rarely frozen over. The inlet, on either side of which lies Istanbul, is called the Golden Horn. The shores, which are elevated, are composed of various volcanic rocks, such as dolerite and granite, but along the remaining course the formations are Devonian. The scenery on both sides is varied and beautiful, being dotted with cypresses, laurels, and plane-trees and covered with palaces, vills., and picturesque gardens. On the European side are many fine buildings of the wealthier citizens of Istanbul.

Bosporan Kingdom, ancient state on the N. Black Sea shores formed by a number of Gk colonies on the Kerch' and Taman' peninsulas c. 480 BC, with Panticapaeum (Kerch') as cap. It was under a Rom. protectorate from 110 BC, and conquered by the Huns c. AD 370. Excavations (since 1816) show that the B. K. attained a high level of culture, combining Greek and local elements. *See M. Rostovtzeff, 'The Bosporan Kingdom,' in The Cambridge Ancient History, vol. viii.*

Bosquet, Pierre François Joseph (1810-1861). Fr. marshal, b. Mont-de-Marsan in Landes. He entered the army in 1833, and went to Algeria a year later. Became a captain in 1839, lieutenant-colonel in 1845, and colonel of a Fr. line regiment in 1847. He returned to France in 1853. In the Crimean War he contributed greatly to the victories of Alma and Inkerman.

He was wounded at the siege of Malakov, where he took a leading part in the assault. He became a marshal of France and a senator in 1856.

Bosruck, tunnel in the Austrian Alps on the Pyhrn railway, 57 m. S. of Linz (q.v.). It is 3 m. long, and the centre point (2178 ft) is on the border between Upper Austria and Styria (q.v.).

Boss, in architecture, either a carved stone keystone of approximately hemispherical form at the intersection of ribs in a Gothic vault, or a similar carved ornament in wood at the intersection of beams in a flat or curved ceiling. The B.s add a rich effect to the vault or ceiling, and are often of great interest and beauty.

Bossi, Enrico (1861-1925), It. organist and musical composer, b. Salò, Lake Garda. He studied at Bologna and later in Milan and, after going abroad, resolved to effect reforms in organ study in Italy. He held various directorial posts, including, from 1916 to 1922, that of the Royal Liceo of Santa Cecilia, Rome. Chief works: *Cantico dei cantici* (biblical cantata); *Il Paradiso perduto* (oratorio after Milton); symphonic poem with voices, *Il cicco*; church music; 2 trios for violin, cello, and piano; and a large amount of organ music.

Bossiney, see TINTAGEL.

Bossu, Le, see ADAM DE LA HALLE.

Bossu, René Le, see LE BOSSU.

Bossuet, Jacques Bénigne (1627-1704), Fr. orator and prelate, b. Dijon, France, on 27 Sept. Although of bourgeois rank, his family took an honourable part in the public and official life of Burgundy. He was destined from infancy for the Church. On his father's appointment to the presidency of the parlement at Metz, Jacques was left to the care of his uncle, whose delight it was to foster his nephew's gifts. At the Jesuits' college where he was educ. he outclassed all other scholars in Greek and Latin. After reading the prophecies of Isaiah he was so struck by the beauty of their poetry that he became virtually 'a man of one book.' The Jesuits endeavoured to enlist him in their society, but his family disliked the proposal and he went to Paris in 1642. He entered the Collège de Navarre, where he achieved distinction. At the age of 24 he was appointed Archdeacon of Metz, and became a priest in 1652. He spent 6 years in pastoral activity and in study of the Scriptures. He wrote at this time a book entitled *Réfutation du caléchisme de Paul Ferry*. He became renowned as a preacher, and was in perpetual request in the city. When he appeared crowds flocked to listen. The queen, Condé, Turenne, and Mme de Sévigné listened to him frequently, and Louis XIV on hearing him for the first time sent a message of congratulation to the young man's father. His discourses have been divided into 3 parts, according to the place where they were uttered: (1) Those of Metz, showing a considerable amount of crudeness; (2) those of Paris, distinguished by strength and splendour; and (3) those of Meaux, in which faultless grace of

composition is the chief characteristic. In 1669 B. was appointed to the diocese of Condom, and later became preceptor to the Dauphin. He resigned the former post and plunged with vigour into his new duties, recognising that on the culture of the Dauphin might depend the future welfare of the Fr. people. During this period he wrote *L'Histoire abrégée de la France, La Politique sacrée*, and the celebrated *Discours sur l'histoire universelle*. In 1671 he was elected a member of the Fr. Academy. About this time he pub. the much criticised and widely trans. *Exposition de la doctrine de l'église catholique*. This book created much discussion, and twice received the imprimatur of the Pope. In 1681 he was appointed to the bishopric of Meaux. Soon after he attended the general assembly of the Fr. clergy, convoked by royal edict, and he preached a great opening sermon on the unity of the Church. In 1688 appeared *L'Histoire des variations des églises protestantes*, a review in 15 books of confessions of faith emitted by Protestant churches during the Reformation period. B. d. in Paris in 1704. He was of unrivalled eloquence and great learning, a defender of the faith, and champion of auct rights and liberties of the Gallican Church. His complete works were ed. by the Abbé Lebarq. 1862-4. See FÉNELON and GALLICANISM. For a full bibliography see *Bibliothèque des bibliographies critiques*, by C. Urban, pub. by the Société des Études historiques, 1900. See also G. Lanson, *Bossuet*, 1901, and E. K. Sanders, *Jacques Bénigne Bossuet: a Study* (Eccles. Biographies), 1921.

Bossut, Charles (1730-1814), Fr. mathematician, b. Tarturas, near Lyons, on 11 Aug. Studied under Clairaut and D'Alembert. From 1752 to 1789 prof. at Mézières. After the revolution he was prof. at the Polytechnic schools in Paris. Wrote *Essai sur l'histoire générale des mathématiques*.

Boston, Thomas (1677-1732), b. Duns, Berwickshire; he was successively schoolmaster at Glencairn and minister in Berwickshire and at Ettrick, Stirlingshire. His best-known work, *The Fourfold State*, was one of the religious classics of Scotland. He also played a leading part in the courts of the Church in the Marrow controversy (q.v.), respecting the merits of an Eng. work, *The Marrow of Modern Divinity*, which he defended against the attacks of the Moderate party in the Church. B.'s autobiography is an interesting record of the Scottish life of his period, full of sincerity and conscious and unconscious humour.

Boston, municipal bor., mrkt tn, and seaport of Lincs (parts of Holland), England, situated on the R. Witham, 31 m. SE. of Lincoln and 107 m. N. of London by rail. It lies in a flat fertile agric. dist. Its name is said to be derived from 'St Botolph's Town,' St Botolph having founded a monastery here in 654 (destroyed by the Danes in 870). St Botolph's Church (14th cent.), the largest par. church in England, is famed for its tower ('Boston Stump'), 272½ ft high.

The Guildhall (1450) contains the cells in which those later known as the Pilgrim Fathers were imprisoned in 1607. Later they founded H., Massachusetts (q.v.). The dock, 7 ac. in extent (1882), and riverside quay, 2640 ft. in length (1938), belong to the corporation. The prin. traffic is in timber, fruit, vegetables, fertilisers, grain, flour, and coal. Prin. industries are agriculture, canning, timber-working, labels and tags, fertilisers, feather purifying, and shell-fishing. Foxe, the martyrologist (1517-87), and Jean Ingelow, the poetess (1820-97), were b. here. Pop. 24,453.

Boston, cap. of Massachusetts, U.S.A., in Suffolk co., situated on an inlet of Massachusetts Bay called B. Harbour, 180 m. N.E. of New York by rail. B. has the longest railway station in the U.S.A., opened in 1898. A series of lines of railway (Boston and Maine, New York, New Haven, and Hartford) converge at this city. At the outskirts of the city is the junction railroad connecting most of these lines with one another. An extensive system of railways, opened in 1901, and a subway relieve the traffic of the streets, and connect the suburbs with the city proper. B. is the third largest wholesale market (after New York and Chicago) in the U.S.A. Its industries produce wool and cotton textiles, shoes, leather, machinery, food products (packed meat and frozen and canned fish), bakery goods, refined sugar, rubber goods, petroleum products, soap, chemicals, medicines, electrical equipment, pianos, and furniture. It has shipyards, shipbuilding facilities, repair yards, and printing and publishing plants. Its port receives fish, wool, hides, rubber, fertiliser, sugar, coffee, fruit, ores, petroleum, coal, wood, pulp, leather, lumber, cotton, flax, hemp, and sisal; it ships textiles, leather, grain products, wood products, cordage, machinery, and other manuf. goods. Logan International Airport, in E. B., built on land dredged from B. Harbour at a cost of \$40,000,000, has the nation's longest runway, 10,212 ft. 3 of 8500 ft. and 2 of 7000 ft., used by 12 airlines. B. Bay is 13 m. long. The climate is generally healthy though exposed to E. winds. B. is one of the finest cities of the U.S.A., and contains some of the choicest examples of architecture. Trinity Church and the Rom. Catholic church are two of the chief glories of the city. The former was begun in 1872, and, built in the Romanesque style of S. France, is the masterpiece of H. H. Richardson. There are windows by Wm Morris, Burne-Jones, and others in it. The mother church of the Christian Scientists (whose H.Q. are at B.) was opened in 1906. The B. public library (1885-1905) is a dignified building of pinkish-grey stone, and is built in the style of the It. Renaissance. The old museum is a red-brick edifice in modern Gothic style. Historically famous buildings are the Paul Revere house, Faneuil Hall, 1742, known as the 'cradle of Liberty' since the revolutionaries met here; Old S. Church, 1730; Old N. Church, 1723; Old State House, 1748; New State

House, 1795; and King's Chapel, 1754. Among other public buildings are Tremont Temple, H.Q. of the New England Baptists, post office and sub-treasury buildings, the U.S. gov. buildings, the co. court house, the Athenaeum, the Massachusetts Historical Society, the Isabella Stewart Gardner Museum of Art, and 3 large hospitals.

The city has an excellent water supply and an elaborate sewage system. Among its many educational institutions may be mentioned the Massachusetts Institute of Technology, a Methodist Episcopal univ., a Rom. Catholic college, the Massachusetts College of Pharmacy, B. College, B. Univ., schools of Harvard Univ., the Massachusetts Normal Art School, and 2 conservatories of music, one, the New England Conservatory of Music, being the largest in the U.S.A. As a musical centre it rivals New York, and was the undisputed literary centre of America until the latter part of the 19th cent. When B. was first settled it was called Shawmut or Trimountaine. It bore a conspicuous part in the early trouble with England, and of all Americans was the most energetic in opposition to Grenville's Stamp Act. With the repeal of that Act came the Declaratory Act, in which Parliament asserted its right to tax the colonies; various duties were imposed, and this led to a boycott by the B. merchants, who were, in fact, urged on to revolutionary courses by one Samuel Adams. The result was that two regiments of regulars were sent to the tn, the attempt to quarter them there leading to what is known as the B. massacre (1770). After the destruction of the Brit.-taxed tea in the harbour (1773), the port was closed and the tn was occupied by a Brit. force, which was compelled to evacuate in Mar. 1776. During the years 1830-1860 it was the H.Q. of the movement for the suppression of slavery. The city has suffered much by conflagration, especially in 1872, when 80 ac. of buildings were destroyed by fire. Bp. of Franklin, Coppley the painter, Poe, Emerson, and other eminent men. Pop. 801,440.

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Boston, card game invented in the last quarter of the 18th cent., and said to have originated in Boston, Massachusetts, during the Brit. siege, among the officers of the Fr. fleet, which lay off Marblehead. The 2 small is. in the Marblehead Harbour, called Great and Little Misery from the period of the Amer. Revolution, correspond to terms used in the game. At the middle of the 19th cent. B. was still popular in Europe, and to a lesser degree in America, since when it has declined in favour.

Boston Tea Party, so called from a large meeting of Americans at B., 16 Dec. 1773, to demonstrate against the attempt of Lord North's Cabinet to force the importation of tea on the colony of Massachusetts by 3 ships which had just arrived in the harbour and were moored at Griffin's wharf preparatory to unloading their cargoes. There was also a large protest meeting at the old S. Church, and as this had no results, on the same night about 50 men who were disguised as Mohawks boarded the Brit. tea ships in the harbour, and cast overboard 342 chests of tea.

Bostonite, igneous rock of the hypabyssal or dyke class, the essential constituents being alkali-felspar, quartz, and biotite. Occurs in Arran and Skye.

Boswell, Alexander (1775-1822), printer and song-writer, son of James B. (q.v.), b. Auchinleck. He was educ. at Westminster and Oxford. He settled at Auchinleck, where he set up a private press and printed many rare books in early Eng. and Scottish literature. In 1817 he contributed 12 songs to Thomson's select collection of original Scottish airs. He was created a baronet in 1821 for a loyal composition entitled *Long live George the Fourth*. In 1822 he fought a duel with James Stuart of Duncarn, who challenged him as the author of certain truculent pasquinades reflecting on his honour and courage. B. was mortally wounded and d. the next day. He was a devoted admirer of Burns, and by his own exertions raised £2000 for the monument on the banks of the Doon.

Boswell, James (1740-95), biographer, b. Edinburgh, son of Lord Auchinleck, a prominent advocate. He was educ. at Edinburgh High School and the univ. of Edinburgh, Glasgow, and Utrecht, where he studied law, being admitted to the Scottish Bar in 1766. At the age of 21 he pub. anonymously an *Ode to Tragedy*. A great lion-hunter, he attained the height of his ambition when he was introduced to Dr Johnson in a London bookshop on 16 May 1763 and succeeded in winning his friendship. Later in this year he went on a continental tour in the course of which he met Rousseau and Voltaire (q.v.), and was introduced to Paoli in Corsica. *An Account of Corsica*, 1768, his first book, was a great success. In the following year he married his cousin, Margaret Montgomerie, by whom he had 7 children, and shortly afterwards began the period of greatest intimacy with Johnson, whose conversation he recorded with such effectiveness until his death in 1784. In 1773 he was elected a member of the famous Club, to which Johnson, Reynolds, Burke, and Goldsmith belonged, and in the same year he induced Johnson to accompany him on the Scottish tour of which he gave an account in *A Journal of a Tour to the Hebrides*, 1785. In 1782 B. succeeded, on his father's death, to a wealthy estate, and made some attempts at a political career, but obtained only the recordership of Carlisle, which he relinquished after a year. In 1789 his wife d., and he accelerated his

own end by the drink and dissipation which had always been his weakness. B.'s *Life of Samuel Johnson*, pub. in 1791, was so successful that a second ed. was called for 2 years later. Unquestionably the greatest biography written in English, it shows a marvellous power of observation and vivid narration. Although an admirer of the great doctor, B. was no mere sycophant, and his account is all the more valuable and entertaining because it reveals the weaknesses as well as the greatness of his subject. The standard ed. is that by G. B. Hill, revised by L. F. Powell, 1934-50. B.'s *Letters* were ed. in 1924, and his *Notebook*, 1776-1777



JAMES BOSWELL

in 1925. About the same time a vast mass of unpub. diaries and papers was discovered at Malahide Castle in Ireland, the seat of his great-grandson. Sections of this were pub. as *Boswell's London Journal*, 1950, and *Boswell in Holland*, 1763-1764, 1952. See P. H. Fitzgerald, *Life of James Boswell*, 1891; C. B. Tinker and F. A. Pottle, *A New Portrait of James Boswell*, 1927; F. A. Pottle, *The Literary Career of James Boswell*, 1929; C. E. Vulliamy, *James Boswell*, 1932; D. R. Wyndham Lewis, *The Hooded Hawk, or The Case of Mr Boswell*, 1947.

Boswell, James (1778-1822), son of Johnson's biographer, a barrister by profession and a member of the Roxburghe Club, was awarded the Vinerian fellowship at Brasenose College, Oxford. He completed his friend Malone's *Shakespeare* (2nd ed.), and also ed. the 3rd variorum *Shakespeare*, 1821.

Boswellia, genus of balsamic plants belonging to the family Burseraceae, comprising 10 Indian and African species. They are said to yield oilanum or frankincense used in incense in Catholic

churches, and one species is supposed to be the *libanus* of Theophrastus, the *thurea virga* of the Romans. *B. thurifera*, a large Indian timber-tree, and *B. serrata*, also Indian, yield a resin.

Bosworth, Joseph (1789-1876), philologist, b. Derbyshire, educ. Repton Grammar School and Aberdeen Univ. His *Elements of Anglo-Saxon* appeared in 1823. His prin. work, a *Dictionary of Anglo-Saxon Language*, was pub. in 1838. In 1858 he obtained the professorship of A.-S. at Oxford Univ.

Bosworth, or Market Bosworth, mkt. tn. of Leics, 12 m. W. from Leicester. Two m. to the S. is R. Field, the site of the last battle between the houses of York and Lancaster, 22 Aug. 1485, when Richard III was beaten by the Earl of Richmond, afterwards Henry VII and slain. Dr Johnson was an usher in the grammar school. Pop. of par. 1000.

Botafogo, residential dist. of Rio de Janeiro (q.v.), Brazil, on B. Bay, lying at the E. foot of Corcovado (2310 ft.). The hill is a notable local landmark; at the summit is a concrete statue of Christ.

Botafogo Bay, inlet of Guanabara or Rio de Janeiro Bay, Brazil.

Botallack, name of a mine on the W. coast of Cornwall, England, 7 m. W. of Penzance. From 1721 it was worked for tin, and in 1841 for copper. The works are at the cliff's edge, and extend over 2000 ft. below the sea.

Botanic Garden, garden designed for the promotion of botanical science. It owes its origin to pharmacy. The earliest European school of medicine was at Salerno, and records exist there of the medical garden of Matthaeus Sylvaticus (1309). In 1333 a similar garden was estab. by the rep. of Venice. Soon many public and private bodies followed the example. The B. G. in the modern use of the term, dates from a private one erected at Padua between the years 1525 and 1533, from the public one at Pisa, estab. by Cosmo de' Medici in 1544, or from that of Padua in 1555. B. G.s were then laid in most It. cities and at the univs. of Leyden, Leipzig, Breslau, and Heidelberg. A royal garden was estab. at Paris in 1597, its chief use being to supply the ladies of the court with bouquets, and it was not until 1616 that its scientific purposes were defined. This garden became famous as the Jardin des Plantes, and chairs of botany and pharmacology were founded in 1635. In the 17th cent. many gardens were laid, the chief including those at Oxford, Chelsea, and Edinburgh. In the 18th cent. further stimulus was given to this movement by Linnaeus. Most European and Amer. univs. now possess B. G.s. In America are also the famous gardens of Philadelphia and New York. Kew Gardens (q.v.) in London, estab. in 1759, are generally regarded as the largest and best-equipped gardens in the world.

The B. G.s at Cambridge are also important, and there are fine gardens at Vienna, Edinburgh, Dublin, Glasgow, Rio de Janeiro, Melbourne, Trinidad,

Georgetown (Brit. Guiana), Vancouver, Sydney, Singapore, Sibpur, near Calcutta, and Peradeniya in Ceylon. The B. G. at Buitenzorg (Java) is particularly well known for the pub. of its *Annales*. Connected with many B. G.s are museums, herbaria, laboratories for research and investigation, etc. The principle of arrangement of the plants is varied, some ranging them according to their geographical distribution, and others according to their medical and economic interests, or in their natural families. The varied origin of the plants necessitates placing them in conditions similar to those from which they were taken.

Botany (Gk *botanē*, herb), science and study of the life, structure, and classification of plants, living and fossil. Since they form the ultimate source of his food supply, plants have been of direct importance to man from very early times, and B. is an ancient science. Solomon 'spake of trees, from the cedar of Lebanon to the hyssop on the wall' (1 Kings iv. 33). The Greeks Herodotus, Plato, and Aristotle studied plants and attempted rude classification; Theophrastus studied plant morphology; Dioscorides wrote one of the earliest books on materia medica, and Pliny wrote of grafting and budding, and sexuality of flowers. About 1200 species of plants had been discovered by Gk. Rom., and Arab herbalists when in 1532 Otto Brunfels, a Bernese physician, pub. his *Herbarium Vivae Elicones*, in which he described about one-fifth of them. This was followed in 1542 by a *Catalogue of Plants* in 4 languages by Conrad von Gesner of Zürich, and in 1545 by *De Historia Stirpium Commentarii Insignes*, a foundational work of botanical nomenclature, by the Ger. Leonard Fuchs (q.v.). Matthias de L'Obel (1538-1616), Fr. botanist to James I, is credited with the arrangement of plants according to their natural relations, further elaborated by Wm Turner, sometimes known as the father of Eng. B. John Gerard, herbalist and barber-surgeon of Holborn, pub. his *Herball*, based on Dodonæus's *Stirpium historiae pemptades* of 1583, in 1597, and it was the standard work of Eng. B. in the 17th cent. Progress in B. was signally marked by the pub. of *Historia generalis Plantarum* in 3 vols., 1686-1704, in which John Ray estab. his true principles of classification, and by Joseph Pitton de Tournefort's *Institutiones Rei Herbariae* in 3 vols., in 1700, which prepared the way for the *Species Plantarum*, pub. in 1753, by the Swede, Carl Linnaeus, in which he introduced the binomial system of nomenclature still in use to-day, whereby each plant is given first the name of its genus, and second the name of its species. In France A. L. de Jussieu pub. his *Genera Plantarum* in 1789, an important contribution to modern methods of botanical classification based on the natural relations of plants. In England George Bentham and Sir Wm Jackson Hooker collaborated in *Genera Plantarum ad Exemplaria imprimis in Herbariis Kewensisibus Servata Definita* (1862-83), which further advanced classification;

and Bentham's series of Flora is still a valued handbook of Eng. botanists.

Branches of botany. While B. studies only one subject, it is divided into different branches, such as: Comparative Morphology, the study of plant form and structure; Histology, tissues; Cytology, cells; and Physiology, study of plants as living and growing organisms—these branches often being studied together under Anatomy; Ecology covers plant distribution and relation to environment; Pathology, diseases and functional disorders; Phylogeny, evolution; Genetics concerning heredity and variation; and Taxonomy, classification and nomenclature. In modern classification the vegetable or plant kingdom consists of: I. Non-vascular plants, divided into (1) Thallophyta, or thallophytes, rootless plants without stem or leaf, usually simple, sometimes unicellular, which include (a) Algae, thallophytes with chlorophyll, consisting of seaweeds and related marine and freshwater plants; (b) Fungi, thallophytes without chlorophyll, saprophytic or parasitic in habit; (c) Lichens, which are algae and fungi living in symbiosis; and (d) Bacteria, unicellular thallophytes without chlorophyll. (2) Bryophyta, plants without true roots and without woody tissue, with some differentiation into stem and leaf, and bearing spores in leafless capsules, which include (a) Hepaticae, or liverworts, and (b) Musci, or mosses. II. Vascular plants, divided into (1) (a) Filicinae, or ferns; (b) Lycopodiaceae, or club mosses; and (c) Equisetaceae, or horsetails. (2) Spermatophyta or Spermatophytes, or Spermatophytes, also called Phanerogams or Phanerogams, or flowering plants, forming true seeds, which include (a) Gymnospermae, plants with seeds not enclosed in a fruit case, consisting of Coniferae (conifers), Taxaceae (yew), Cycadaceae (cycads), Ginkgoaceae and Gnetales; and (b) Angiospermae, plants with seeds enclosed in a fruit case, which are sub-divided into (aa) Dicotyledons, seedlings with 2 cotyledons or seed leaves, and leaves net-veined, and in turn have flowers with un-united petals, known as Archichlamydeae or Polypetalae, or flowers with united petals, known as Metachlamydeae or Sympetalae; and (bb) Monocotyledons, seedlings with 1 cotyledon, leaves mostly parallel-veined.

See BACTERIA; CLASSIFICATION, PLANT; CYTOLOGY; DICOTYLEDON; ECOLOGY; FLOWER; FUNGI; GARDENING; GENUS; GEOGRAPHICAL DISTRIBUTION, Plants; HEREDITY; MONOCOTYLEDON; MORPHOLOGY; NATURAL ORDER OF PLANTS; PARASITIC PLANTS; PLANTS AND PLANTING; SAPROPHYTES; SPECIES; SYMBIOSIS; THALLOPHYTES; and articles on individual families, species, plants, and botanists.

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Botany Bay, inlet of about 16 sq. m. on the coast of New S. Wales, Australia, 6 m. S. of Port Jackson (Sydney Harbour). It is the outlet of the George's R., and is surrounded by the S. suburbs of Sydney. It was discovered in 1770 by Capt. Cook, who landed at a spot now marked by a monument and took possession for the Crown. It received its name from John Banks, the botanist of the party, on account of the great variety of its flora. The tn was fixed upon as a convict settlement, but the idea was abandoned and the settlement was made at Sydney instead. The first governor was Arthur Phillip, 1788. The transportation of criminals to New S. Wales ceased in 1840.

Botev, Khristo (1848-76), Bulgarian poet and patriot. In 1865 he went to Odessa Gymnasium where he was deeply influenced by the liberal ideas of the sixties. After an unsatisfactory year at home he was sent to Russia again (1868) to become a doctor, but went off instead to Rumania where, till 1874 with Karavelov, and then alone, he led the Bulgarian liberation movement. On the outbreak of a rising against the Turks he led a band into Bulgaria to join the insurgents, but he and his band were annihilated before reaching the insurgents. His poems breathe extreme courage and patriotism and his influence on Bulgarian literature is out of all proportion to the amount (22 poems) that he wrote. A selection in English was pub. in Sofia, 1948.

Botfly, any species of dipterous insect of the family Oestridae. These flies are large and hairy, with short antennae, and their larvae are usually to be found in mammals. *Gastrophilus equi* is the gadfly of the horse, which lays its eggs on the animal's hairs; the horse is irritated

and licks them off, the larvae remain in its stomach until ready to pupate, then pass out and become mature external to their host. *Oestrus ovis* occurs in the nostrils of sheep; *O. tarandi* in the skin of the reindeer; *Hypoderma bovis* on the legs of cattle, and the larvae often occasion warbles or tumours under the skin of the back.

Both, Jan (c. 1610-52), and **Andreas** (1609-50), Dutch painters, b. Utrecht. They early went to Italy, being two of the first Dutch painters to come under its influence. At Venice it is said that Andreas was drowned in a canal. The two worked together, Jan painting the landscapes into which Andreas painted the figures and animals. Both brothers also executed etchings.

Botha, Louis (1862-1919), S. African general and statesman, first Premier of the Union of S. Africa, son of one of the Voortrekkers, b. Greytown (Natal). He saw active service in savage warfare and served as field cornet in 1887. Soon after he settled in Vryheid dist., which he represented in the Volksraad of 1897. In the war of 1899 he served under Lucas Meyer, but he soon received higher commissions. He was in command of the Boers at Colenso and Spion Kop. During these conflicts he gained so high a reputation that he was made commander-in-chief of the Transvaal Boers on the decease of Gen. Joubert. After the fall of Pretoria he reorganised the Boer resistance with a view to continued guerrilla warfare. This movement was successful in its aim, for the Boers resisted for 3 years. He was chief representative of his countrymen in the peace negotiations of 1902. He went to Europe with Gens. De Wet (q.v.) and De la Rey in order to raise funds to enable the Boers to resume their former employments. During the period of reconstruction under Brit. rule, L. gave liberal advice with regard to measures which he thought would tend to the maintenance, order, and prosperity of his people in the Transvaal. After the granting of self-gov. to the Transvaal in 1907, B. was called upon by Lord Selborne to form a gov. In the next year he was present at the colonial conference in London. On this occasion he declared the wholehearted adhesion of the Transvaal to the Brit. Empire and his intention to work for the welfare of the country. Owing to a serious disagreement with Gen. J. B. M. Hertzog (q.v.), he re-formed his Cabinet in Dec. 1912, from which Hertzog was excluded. B., however, had a loyal colleague in Gen. J. C. Smuts (q.v.), to whom he entrusted the difficult question of Indian settlement in 1913, which was led by Gandhi (q.v.), who came from India to voice Indian views, and who soon returned there satisfied with the arrangements made. Although B. was a man of great moderation, he could, nevertheless, take a firm and even arbitrary line when the occasion demanded it. The outbreak of war in 1914 was a testing time for many in S. Africa, for the Ger. agents from Ger. SW. Africa had been busy among all

classes with anti-Brit. propaganda and had met with varying success. It was known further that sev. hundred S. African rebels had joined the Ger. forces. With B. there was no hesitancy; his loyalty to the imperial gov. was exhibited in his instant declaration of support for Great Britain. This was a contingency that the Germans had overlooked, although they were more successful with De Wet, Beyers, and Maritz. He organised the S. African forces under himself as commander-in-chief. His intention was to capture Lüderitz Bay, and thus close it to the enemy as a base for combined land and sea operations. His columns were moving towards this point when Maritz, the commander of one of them, deserted with his force to the Germans. Later, when Beyers, Kemp, and De Wet headed a rebellion against the gov., B. took the field against them, captured De Wet, and ended the rebellion. It was not until Jan. 1915 that B. could turn to his original intention of overthrowing the Germans. Though the fighting never reached serious proportions, the natural conditions of the country, the well-planned obstacles, and the necessarily long lines of communication made progress difficult. The first strategic objective was to seize Windhoek before the Germans could initiate a guerrilla campaign, and thus paralyse their efforts in the surrounding country. B. commenced his advance in Mar. and reached his objective in May. He then pursued the enemy along the railway to Tsumeb, where he destroyed them as a fighting force. Resuming his duties as Prime Minister of the Union, he organised forces to assist the Brit. invasion of Ger. E. Africa and for the W. front in Europe. He was invited to become a member of the imperial War Cabinet in England, but sent Smuts, whose absence threw a heavy burden upon him. He came to England after the armistice, and attended the peace conference at Versailles, where he was a most impressive figure, notwithstanding that he was undergoing medical treatment at the time. The terms of the peace treaty were not entirely to his liking, and his frank opinions on them won him the respect of all the delegates. He was also a supporter of the rights of the dominions and the status of their delegates. He returned to Pretoria and d. on 27 Aug. 1919, in his fifty-seventh year, from heart failure following influenza. He was a simple, God-fearing man with a wide knowledge of human nature and a fund of practical wisdom. His patience, tact, and moderation gained him a reputation as a 'manager of men.' His loss was mourned by English, Dutch, and natives alike, his kindness and largeness of heart making him beloved by all. At his graveside Gen. Smuts said: 'His was the largest, most beautiful, sweetest soul of all my land and days.' See S. J. P. Kruger, *Memoirs*, 1906; Earl Burton, *General Botha*, 1924; E. A. Walker, *A History of South Africa*, 1940; Deneys Reitz, *Commando: a Boer journal of the Boer War*, 1943.

Bothnia, former name of a country of N. Europe which extended along the E. and W. coasts of what was then, as it is now, the Gulf of B. The E. portion is now included in Finland (q.v.) and the W. in the Swedish prov. of Norrland (see SWEDEN).

Bothnia, Gulf of, part of the Baltic Sea between 60° and 66° N. lat., and 17° and 25° 30' E. long. To the S. are the Åland Is.; the E. shore of the gulf is part of Finland, the W. and N., of Sweden and Lapland. The depth varies from 20 to 50 fathoms. Navigation is rendered difficult by the number of small is., sandbanks, and cliffs, or *skaers*, but there are many good harbours. Numerous rivs. flow into the gulf from Sweden and Finland; the alluvial deposit from these has caused the land to encroach on the sea in the upper part of the gulf. The contrary has been the case in the SW., where the sea is gradually overflowing the land. The salinity of the water is not great, and is less when the rivs. are flowing into it. In winter the whole surface is generally frozen so hard that sledges can be driven over it.

Bothwell, Adam (c. 1527-93), divine, Bishop of Orkney, 1562. He was one of the 4 Scottish bishops who embraced the Reformation. He performed, after Protestant form, the marriage ceremony of Mary and Bothwell at Holyrood House, but soon afterwards deserted her party, and crowned and anointed her infant son, Prince James, at Stirling, 1567. B. was for a time suspended from the ministry by the General Assembly, 1567, for solemnising the marriage of Mary and Bothwell. He exchanged a part of his bishopric of Orkney with Robert Stewart for the abbacy of Holyrood House, about 1570.

Bothwell, James Hepburn, Earl of (c. 1536-78), Scottish nobleman. He was the son of the third earl, and succeeded his father in 1556. In addition to the family estates and titles, he succeeded also to the hereditary offices, which included that of the Lord High Admiral of Scotland. He showed himself at the beginning of his career to be anti-English, and he joined himself to the party of Mary of Guise, although he himself was a Protestant. He had a violent quarrel with Arran, a quarrel which originated in his appropriation of a sum of money which was sent by Queen Elizabeth to the lords of the congregation. He was employed by the Scottish courts on many missions, and in 1561 was sent from Paris by Mary Queen of Scots to summon Parliament. He made peace with various of his rivals, but although he had but recently been made a privy councillor, he again was ordered to leave the city when riots broke out between himself and his enemies. He was imprisoned, but escaped, and although he again submitted to the queen, he was forced into exile owing to the predominance of the influence of Moray. In 1564, being captured on Holy Is., he suffered a short imprisonment again, this time in the Tower. He was recalled, however to

aid Mary in putting down the insurrection of Moray, and it is at this point that he comes forward as the champion of Mary. Mary was becoming tired of her feeble husband, Darnley. The murder of Rizzio in Mar. 1566 marks the beginning of B.'s ascendancy, and Mary began to show a preference for him. He was made the most powerful noble in Scotland, and estates were showered upon him. Mary's role in Darnley's murder remains a mystery, but it is certain that B. was the driving force behind the plot, and he himself superintended all the arrangements which led to the blowing up of Kirk o' Fields. B. stood his trial for the murder, but Lennox, who was the chief prosecutor, was virtually forbidden to attend, and B. was declared not guilty. He now made preparations for his marriage with Mary, and although his previous marriage was declared null and void, it is doubtful whether his marriage to Mary was legal according to the law of the Rom. Catholic Church. On 12 May he was created Duke of Orkney and Shetland, and on the 15th Mary and he were married according to the Protestant rites. The nobility, however, rallied to defeat him, and he was defeated at Carberry Hill. B. parted from Mary, reached the Orkneys, and from there sailed to Norway. He was captured by the authorities and sent to Copenhagen. He still corresponded with Mary, but her feelings for him seem to have changed from passion to revulsion, and she demanded a divorce, which she obtained in 1570. His later years were spent in solitary confinement in the castle of Dragsholm in Zealand, which brought on insanity. See also MARY QUEEN OF SCOTS. See P. Hume Brown, *History of Scotland*, 1908-9, and life by R. G. Browne, 1937.

Bothwell, tn of Lanarkshire, Scotland, situated on the r. b. of the Clyde, a residential quarter of Glasgow. The riv. is crossed by a suspension bridge; a second bridge gives its name to the battle fought between the Royalists under Monmouth and the Covenanters in which the latter were utterly defeated (1679). In the vicinity is the splendid Norman ruin of B. Castle. There is also a priory founded in the 13th cent. The mausoleum of B. was the bp. of Joanna Baillie (1762-1851), dramatist and poetess. Pop. 3600.

Bothy, or **Bothie**, originally a cottage or hut, but later the word came to mean a barely furnished and generally uncomfortable dwelling for farm servants. The system prevails in the E. and NE. dists. of Scotland, and consists of building the outhouses (barns, stables, etc.) of a farmstead in the form of barracks in which the male servants reside.

Botianates, see NICEPHORUS III.

Botley, par. of Hants, England, on the Hamble, 6 m. from Southampton, a centre for growing early strawberries. It was the home of Wm Cobbett. Pop. 1500.

Botocudos, barbarous tribe of S. Amer. Indians of E. Brazil, inhabiting the E. Coast Range. Their name is derived

from the Portuguese *botoque*, a plug, with reference to the wooden plugs or disks worn in their lips. They are below medium height, broad-shouldered, and remarkable for the depth and muscular development of chest. Their features are broad and flat, with high cheek-bones, wide nostrils, and thick lips. They are of a light yellowish-brown colour and have the general yellow tint of Mongolic races.

Botolph, St (d. c. 680), Eng. missionary of whom little is known beyond the fact that, after a period in a Fr. monastery, he founded an abbey at Iken in Suffolk. More than 70 Eng. churches were dedicated to him. His feast is on 17 June.

Botopani, commercial tn of Rumania, in the prov. of Suceava, 47 m. SE. of Chernovtsy. Pop. (1930) 32,400.

Bo-tree, or **Bodhi-tree** (*Ficus religiosa*), family Moraceae; is sometimes called the peul-tree. It has long, sharply pointed leaves from which rain drops off rapidly, and grows in damp forests. The milky latex yields caoutchouc. Vishnu (q.v.) is said to have been born beneath this tree.

Botrychium, genus of ferns of the family Ophioglossaceae which grow in temperate and tropical lands, and in Britain are represented by *B. lunaria*, the common moonwort. The stem is a subterranean rhizome, the roots are fleshy, branched, and produce no buds, and the leaves grow so slowly that they take 5 years to show above ground. The sporophylls are petiolate and bear a fertile and a sterile lamina, which are usually both branched. The prothallus is a small, ovoid body, with scattered root-hairs, and usually bear antheridia on the upper, archegonia on the lower, surface. The prothallus of *B. virginianum* remains fixed to the sporophyte for about 5 years.

Botryllus, typical genus of tunicates of the family Botryllidae. The species are submarine, very small, soft, and contractile, and are found adhering to other bodies in bunches of 10 or 12 arranged like rays of a star round a common centre. They are found in Europe, N. America, and the Mediterranean.

Botrytis, genus of fungi of the order Moniliales, of which sev. are plant parasites, including *B. cinerea*, a common saprophyte which is also parasitic and responsible for Grey Mould infections among plants; *B. allii* causes neck rot of onions; *B. tulipae* causes Fire in tulips.

Botta, Carlo Giuseppe Guglielmo (1766-1837), It. poet and historian, b. San Giorgio del Canavese, Piedmont. He studied medicine, and became a doctor in the Fr. Army. In 1799 he was appointed a member of the provisional gov. of Piedmont. After the incorporation of Piedmont with France he went to Paris, where as a member of the corps législatif, he expressed views hostile to Napoleon. After the Restoration he became rector of academies at Nancy and Rouen. In 1830 he was allowed to return to his native tn and received a pension. He continued Guicciardini's hist. of Italy down to the fall of Napoleon.

Botta, Paul Émile (c. 1802-70), Fr.

traveller and archaeologist, son of Carlo Giuseppe B. As physician to Mehemet Ali he accompanied his expedition to Sennaar in 1830. He was subsequently appointed consul-general at Tripoli. During 1843 he made his memorable explorations of the mounds of Konyanjik and Khorsabad. His chief work was *Monuments de Ninivé découverts et décrits par P. E. Botta*.

Bottego, Vittorio (1861-97), It. explorer. In 1892 he started from Berbera and reached the Upper Juba, which he explored to its source. Between 1895 and 1897 he explored the neighbourhood of Lakes Margherita and Rudolf, and the Sobat riv. system, but in the latter year was murdered in the Abyssinian highlands by the Somalis. For an account of his first journey see his book *Viaggi di Scoperta nel Cuore dell' Africa*, 1895; for an account of the second see *Seconda Spedizione Bottego*, 1899, by Varmutelli and Citerini.

Bottesini, Giovanni (1821-89), It. double-bass player and composer, b. Crema in Lombardy. He went on a concert tour in 1840 which extended to America. During this tour he estab. his fame as the greatest master of the double bass. He directed It. opera from 1846 in Havana, Paris, Palermo, and Barcelona. He became director of the Conservatory at Parma. B. composed among other works at least 4 operas and an oratorio. He wrote *Méthode complète de Contre-basse*.

Böttger, Johann Friedrich (1682-1719), see PORCELAIN, *Hard-paste*.

Botticelli, Sandro, more properly **Alessandro di Mariano del Filipepi** (c. 1445-1510), Florentine painter and perhaps the most poetic of the great Renaissance Italians. He derived his name of B. apparently from his eldest brother, who was a broker in a fair way of business, and who seems to have taken charge of the boy; his brother was nicknamed Botticello. He seems to have been physically weak, and was probably at an early age apprenticed, since his father was too poor to permit him to remain at home and do nothing. He would seem to have spent his early apprenticeship with his brother Antonio, who was a goldsmith, but having shown a great aptitude for painting he was apprenticed to Fra Filippo Lippi (q.v.). For 8 years he remained under the guidance of this master, and was probably employed in helping to complete the frescoes which Lippi had been commissioned to do at Prato. In 1467 Lippi left Florence for Spoleto, and B. was left to do his work without the influence of the master. At this period he seems to have come under totally fresh influences, from which he learnt much that he would probably never have learned from Lippi. In 1470 appeared one of his great pictures, 'Fortitude,' which is at present in the Uffizi. The realistic influence of this period of his life is also obvious in the paintings of 'Judith and Holofernes' and 'St Sebastian.' During this period he had also come into contact with a number of the painting schools of

Faces, 1940, *London Pride*, 1941, *From the Life*, 1944, *Fortune's Finger*, 1950. *The Challenge*, 1953, and *Man and Beast* 1954; *Search for a Soul*, 1947, is autobiographical.

Bottomley, Gordon (1874-1948), poet and dramatist, *b.* Keighley, and educ. at the grammar school there. Owing to early and continuous ill health he was obliged to lead a secluded and inactive life. His first book of verse, *The Mickle Drede*, appeared in 1896, and this was followed at intervals by a dozen or more vols. of poems, mostly in dramatic form. His first major vol. of poetry was *The Gate of Smaragdus*, pub. in 1904. The plays *The Crier by Night*, 1902, and *The Idding to Lithend*, 1909, first illustrated his devotion to the cause he had at heart—the resurrection of Eng. poetic drama, a cause he shared with W. B. Yeats and Lascelles Abercrombie (q.v.). But it was not until the production of his play, *King Lear's Wife*, 1915, a prelude to Shakespeare's play, that he became in any sense a popular poet. B. never had any notable success on the regular stage, and in his later period he confined himself to shorter dramatic poems, like *The Widow*, *The Singing Sands*, and *Ardorlich's Wife*. Although the more ambitious and beautiful play, *Gruach*, 1921, a prelude to Shakespeare's *Macbeth*—which was awarded the Femina-Vie Heureuse prize in 1923 and produced in London 1924—perhaps marks the peak of his achievement, the later, briefer, lyrical dramas are his most characteristic work. In form, influenced by Yeats's and Sturge Moore's experiments after the manner of the Jap. *No* plays, their choice of theme gave them a distinction all their own. He brought back into verse drama much of the romanticism and at times extravagance of the post-Elizabethan dramatists. In *Poems of Thirty Years*, 1925, he collected all of his lyrical verse which he deemed worthy of preservation. In 1925 he was awarded the Benson medal of the Royal Society of Literature, of which he became a fellow in 1926, and he received honorary doctorates from Aberdeen (1930), Durham (1940), and Leeds (1944).

Bottomley, Horatio William (1860-1933), journalist and financier. He worked for a time in a solicitor's office in London, and then, after various business experiences, he turned to journalism and founded the *Financial Times*. His next journalistic venture was the highly successful weekly, *John Bull*. But he is remembered chiefly for his various company promotions and for the remarkable skill with which he defended the various actions brought against him for fraud. He was Liberal M.P. for Hackney from 1906 to 1912 and from 1918 to 1922, though he took an independent line. In 1922 he was sentenced to 7 years' penal servitude for fraud in connection with Victory Bonds. In the First World War he gained a great reputation as a patriotic orator. See life by J. Symons, 1955.

Bottomry, maritime term. When it is a matter of vital importance to raise

money for the proper completion of a ship's voyage, and there is no time to communicate with the owners, and the master has exhausted every other means for raising money, then he may 'hypothecate' the vessel and, in some cases, the cargo, i.e. he may give a bond or written contract for the loan of the money advanced on the security of the ship and freight. This bond binds the owners to repay the loan within a limited time after the safe arrival of the ship, but if the ship does not arrive safely the money is not repaid. The holder of a B. bond has a right to be paid before a mortgagee, but will not be paid until claims for wages or salvage have been satisfied. Where sev. bonds have been given, the last comes takes priority over the others.

Botrop, Ger. tn in the Land of N.-Rhine-Westphalia (q.v.), at the N. edge of the Ithur dist. (q.v.), 26 m. N. by E. of Düsseldorf (q.v.). It is a well-laid-out tn of recent origin, and is an important coal-mining centre. Pop. 104,800.

Botulism (from Lat. *botulus*, a sausage), an acute and frequently fatal disease caused by poisoning from the toxins produced by the *Bacillus botulinus*. This bacillus, which is anaerobic and therefore able to grow in the absence of oxygen, is a contaminator of meat, and may be present in tinned foods. B. is characterised by paralysis of the cranial motor nerves and of the diaphragm, and by a disturbance of the secretion of the mouth and pharynx. See FOOD POISONING.

Botwinnik, Michael Moiseiwitsch (1911-), Russian chess-master, *b.* St Petersburg. From 1930 onwards he dominated the scene in Soviet chess and he was many times Soviet chess champion. In 1948 he won the world championship in a tournament specially arranged by the World Chess Federation to fill the vacancy left by Alekhine's (q.v.) sudden death 2 years before. B. successfully defended his title by drawing matches with Bronstein in 1951 and Smyslov in 1954. He divides his time equally between chess and his profession of electrical engineering. An outstandingly successful tournament player he has scored many victories in important events, notably at Nottingham (1936), where he was equal first with Capablanca (q.v.), Groningen (1946), and the Alekhine Memorial Tournament at Moscow (1956). He has written comparatively few books on chess but these, like his actual play, are characterised by a deep understanding of strategy. See his *Championship Chess*, 1950.

Botwood, seaport of Newfoundland at the mouth of the Exploits R. A railway runs from B. into the interior. It is the port for the export of timber products of Grand Falls and of the lead, zinc, and copper concentrates from Buchans.

Botzen, see BOLZANO.

Bouch, Sir Thomas (1822-80), civil engineer, *b.* Thursley in Cumberland. His earliest tastes were for engineering, and in 1839 he began his career with a civil engineer. After this he was an engineer on the Stockton and Darlington railway, and in 1849 became manager

and engineer of the Edinburgh and N. railway, and it is to him that the Forth and Tay owe their 'floating railways.' He was the engineer of the Tay Bridge, finished in 1877, for which the freedom of the tn of Dundee was conferred upon him. He was also made a knight. The disaster of the Tay Bridge in 1879 was the cause of his health giving way, owing to mental shock, and of his death in the following year.

Bouchain, Fr. tn in the dept of Nord, on the Scheldt, 12 m. from Valenciennes. Pop. 2400.

Bouchardon, Edmé (1698-1762). Fr. sculptor, b. Chaumont. He studied in Paris under Guillaume Coustou, and later in Rome. A strict classicist, he was considered the greatest sculptor of his day. His best-known work is the 'Fountain of Grenelle,' in Paris, while an equestrian statue of Louis XV was destroyed in 1792. See life by Comte de Caylus, 1762.

Boucher, François (1703-70), Fr. painter, b. Paris. Studied at Rome, and became member of the Academy in 1734. In 1764 he was appointed court painter to Louis XV. The number of his figure or landscape pictures and drawings is said to have exceeded 10,000, and he also executed engravings. He became director of the Fr. Academy, which post he retained until his death, taught Madame de Pompadour painting, was chief designer to the Royal Beauvais Tapestry manufactory, and designer for the Opéra. In these capacities he was the leading exponent of the graceful, facile, and somewhat shallow art of the age of Louis XV, though painters especially have always admired his superb skill. He is well represented in the Louvre and the Wallace Collection, London. See A. Reichel, *Boucher*, 1925.

Bouches-du-Rhône, maritime dept of SE. France, in Provence (q.v.), containing the delta of the Rhône (q.v.). It consists of 3 arrons.: Marseille, Aix-en-Provence, and Arles (qq.v.). The W. portion, known as the *Camargue* (q.v.), is plainland, and in the N. and E. the Maritime Alps (q.v.) slope down to the Rhône basin. Between the mts and the sea is an arid plain called *la Crau* (q.v.). The sea coast is much indented and has many lagoons (see BÈREGE); there are also inland ponds. The amount of arable land is small, though some cereals are grown. Olives are grown extensively in the NE., and there is much stock-raising, particularly horses and cattle. Lignite and bauxite are found, and salt is worked. There are heavy industries in Marseille, the cap. Area 2025 sq. m.; pop. 1,048,800.

Boucicault, Dionysius (Dion) Lardner (1822-90). Irish dramatist and actor, b. Dublin; educ. at Univ. College, London. He made an immediate success with his *London Assurance*, at Covent Garden, in 1841. He soon wrote other pieces, among them *Old Heads and Young Hearts*, *Louis XI.* and *The Corsican Brothers*. He made his first appearance as actor in 1852, in a play of his own, *The Vampire*. From 1853 to 1860 he was in America.

On his return to England he produced the first of a series of his own Irish plays, *The Colleen Bawn*, 1859, at the Adelphi Theatre. This met with great success in the U.K. and in America. It was followed by *Arrah-na-Pogue*, 1864, and *The Shaughraun*, 1875. He wrote over 50 plays.

Boudicca, see BOADICEA.

Boudin, Eugène Louis (1825-98). Fr. marine painter, b. Honfleur. He studied in Paris, and led the Ecole St Sulpice school of artists, so named from the fact that its H.Q. were at a farm of that name. The group included, among others, Corot, whose follower B. was; Monet, his disciple; Isabey; Millet; and Courbet (qq.v.). He worked much at Le Havre and is especially noted for his riv. and Normandy coast scenes, now highly valued. His 'Corvette russe' was bought for the Luxembourg in 1888, as also was his 'Rade de Villefranche.' He was awarded the Légion d'Honneur in 1898. See M. G. Jean-Aubry, *Eugène Boudin*, 1922.

Boufarik, tn of Algeria, 23 m. S. of Algiers by rail. Pop. 13,000.

Boufflers, Louis François, Duc de (1644-1711), marshal of France who attained great distinction, and was descended from one of the oldest families in Picardy. Serving under Condé, Turenne, Créqui, and Catinat, he attained rapid promotion, and his marshal's baton in 1693. His masterly defence of Namur in 1695 against William III, and of Lille in 1708 against Prince Eugène, received recognition by the king, and he was made a duke and peer of France. His ability was clearly shown by the manner in which he conducted the retreat from Malplaquet in 1709.

Boufflers, Stanislaus Jean, Marquis de (1738-1815), Fr. administrator and writer, son of the Marquise de B., mistress of Stanislaus, King of Poland, b. Lunéville. He was famous for his elegant manners and conversation. His works consist of poems, travels, *éloges*, and tales. In 1784 he was made a marshal in the army, and in 1785 became governor of Senegal (q.v.) in Africa, where his administration was most enlightened. He went to Prussia in 1792, returning to France in 1814, when he was made joint librarian of the Bibliothèque Mazurine.

Bougainville, Louis Antoine de (1729-c. 1811), Fr. navigator, b. Paris. Studied law, but entered the military profession in 1753. At the age of 21 he pub. a treatise on the integral calculus as a supplement to L'Hôpital's treatise. *L'Analyse des infiniment petits*. In 1755 he became secretary to the Fr. embassy in London. In the next year he went to Canada as captain of dragoons and aide-de-camp to Montcalm. He was rewarded with the rank of colonel and the cross of St Louis. He served in the Seven Years War. He undertook the task of colonising the Falkland Is., but the Fr. Gov. gave them up to the Spaniards. He then went on a voyage of discovery which lasted 2 years, 4 months. Saw active service in the navy, became vice-admiral in 1791. He was a senator under Napoleon

I, a count of the empire, and a member of the Légion d'Honneur.

Bougainville, largest member of the Solomon Is., which belonged to Germany from 1899 to 1914, and was assigned to Australia after the First World War. B. is of volcanic origin and is mountainous, with the Emperor Range in the N. and Crown Prince Range in the S. Exports are copra, ivory nuts, and tortoiseshell. The is. is named after Louis B. (q.v.), who landed here 1769 when on a voyage of discovery round the world. B. was occupied by the Japanese during the Second World War. Area about 3880 sq. m.; pop. about 40,000. See also PACIFIC CAMPAIGNS, OR FAR EASTERN FRONT, IN SECOND WORLD WAR and SOLOMON ISLANDS.

Bougainvillea, S. Amer. genus of the family Nyctaginaceae. The flowers are arranged in groups of threes, and are surrounded by an involucre of petaloid bracts, red or lilac in colour. *B. spectabilis* is a beautiful tropical creeper with lilac-coloured bracts.

Bough, Samuel (1822-78), landscape painter, son of a shoemaker, b. Carlisle. A scene painter in early life and self-taught in art, in 1849 he began an earnest study of nature, working at Hamilton and Port Glasgow. He also supplied landscape illustrations for books. He became a member of the Royal Scottish Academy in 1875. Chief pictures (mainly water-colour) are 'Shipbuilding at Dumbarton,' 'Canty Bay,' 'The Rocket Cart,' and 'Borrowdale.'

Boughton, George Henry (1836-1905), painter, b. near Norwich, was taken as an infant to Albany, New York, but settled in London in 1861. Elected R.A. in 1896, he exhibited many pictures at the Royal Academy. Sev. of his pictures represent the old Puritan life in New England. The Tate Gallery has his picture entitled 'Weeding the Pavement.'

Boughton, Rutland (1878-), Eng. composer, b. Aylesbury; he entered the Royal College of Music as a student in 1900. He supported himself by playing in an orchestra, and later by teaching at the Midland Institute of Music in Birmingham, where he continued until 1911. In 1914, in collaboration with Reginald Buckley, he founded the Glastonbury Festival School of Music Drama, and it was here that the music drama *The Immortal Hour* was produced. The Glastonbury Festival was revived after the First World War, when 2 other operas by B., *The Birth of Arthur* and *The Round Table*, were performed in Aug. 1920. In 1922 *The Immortal Hour* was produced in London, where it had a long run. Other works include the music dramas *Alkestis*, *The Queen of Cornwall*, and *Bethlehem*; *The Moon Maiden*, a choral ballet; *Agin-court*, a dramatic score for male voices; 2 symphonies, *Cromwell* and *Deirdre*; and 2 string quartets.

Bougie: 1. Seaport of Algeria, 120 m. E. of Algiers. It is beautifully situated on the slope of Mt Garaya. It is an anct tn, and was the Saldæ of the Romans. In the 5th cent. it was the chief seat of the

Vandals. Under the Arabs it was named the little Mecca. The tn fell into decay after the 16th cent., and when captured by the French in 1833 it consisted of little more than a few fortifications and ruins. It has now become a strong fortress and a port of great commercial value. The Fr. word for candle is probably derived from the name of the tn, candles being first made of wax imported from B. Pop. 44,376.

2. Tn. of W. Australia, amalgamated with Kalgoorlie (q.v.) in 1947.

Bougie, cylindrical instrument made of waxed silk, gum-elastic, rubber, or metal, which may be passed into the gullet, urethra, or other passage for the purpose of dilation or examination.

Bouguer, Pierre (1698-1758), Fr. mathematician, b. Croisic, Brittany, where his father was regius prof. of hydrography. At an early age young B. succeeded his father as prof. In 1727 he gained a prize given by the Academy of Science for his paper 'On the best manner of forming and distributing the masts of Ships.' In 1729 he pub. *Essai d'optique sur la gradation de la lumière*. He became prof. of hydrography at Le Havre, and in 1749 he wrote *La Figure de la terre déterminée*, which gave the results of the expedition to S. America, in which he took part, to measure the length of a degree of the meridian near the equator.

Bouguereau, Adolphe William (1825-1905), Fr. painter, b. La Rochelle. Studied art at the Ecole des Beaux-Arts during the years 1843-50, when he won the Grand Prix de Rome. This enabled him to study in Italy until 1855. In 1847 he began regularly to exhibit at the Salon. In 1855 he exhibited 'The Martyr's Death' (the body of St Cecilia borne to the Catacombs), which was afterwards placed in the Luxembourg. Very popular and well known through engravings of his works, B. has been much criticised as the main representative of a sentimental and insipid type of academic painting, though his pupils included some famous painters. He was a member of the Légion d'Honneur in 1856, an officer of the order in 1876, and commander in 1885.

Bouhours, Dominique (1628-1702), Fr. critic, b. Paris. Entered the Society of Jesus, and was appointed to read lectures on literature in the Collège de Clermont in Paris, and on rhetoric at Tours. He became preceptor of the 2 sons of the Duke of Longueville, who d. in B.'s arms. He wrote an account of the death of his former patron. B. was sent to Dunkirk to the Rom. Catholic refugees from England, and he pub. sev. books during his missionary work there. Among these were *Les Entretiens d'Ariste et d'Eugène*, 1671, a critical work on the Fr. language. Other works are *La Manière de bien penser dans les ouvrages d'esprit*, 1687, *Doutes sur la langue française*, 1674, and *A Life of St Ignatius*, 1679. He d. at Paris.

Bouillabaisse is the name of a Fr. dish, popular especially in Provence. It is composed of a large fish, to which are added sev. smaller ones cut up; onions,

saffron, sliced tomatoes, olive oil, etc., are then put in, and the whole cooked in a casserole.

Bouillaud, Jean Baptiste (1796-1881), Fr. physician, b. Bragette, near Angoulême. After serving under Napoleon, B. studied medicine at Paris and qualified in 1823. He became prof. of clinical medicine in 1831. He was one of the best diagnosticians of his time, but relied too much on blood-letting as a form of treatment. His work on the heart was outstanding; he demonstrated the relationship of heart disease and acute rheumatism, gave a classical description of aphasia (loss of speech), and located the speech centre in the anterior lobe of the brain. His best work is his *Traité des Maladies du Cœur*, 1835.

Bouillé, François Claude Amour, Marquis de (1739-1800), Fr. general, celebrated for many exploits before the era of the revolution. He held liberal principles and sat in the first assembly of the Notables, and after attempting to assist Louis XVI in pursuing his journey from Varennes after his flight from Paris, he quitted France and served under the allies. He d. in London.

Bouillon, see GODFREY DE BOUILLON.

Bouillon, fortress tn in the prov. of Luxembourg, Belgium, situated on the R. Semois, 9 m. S.E. of Sedan. B. was French from 1678 to 1815, when it passed to the Netherlands, becoming Belgian in 1837. Godfrey de B., the crusader, was one of the counts of B. Here Napoleon III of France spent the first night of his exile after the battle of Sedan, 1870. Pop. 2800.

Bouilly, Jean Nicolas (1763-1842), Fr. author and dramatist, b. near Tours. During the revolution he held sev. high offices under the new gov., and was largely responsible for the organisation of primary education. He retired from public life in 1799, and devoted himself to literature. He wrote the musical comedy *Pierre le Grand* for Grétry's music (1790), the opera *Les Deux Journées* to Cherubini's music (1800), and *L'Abbé de l'Épée* (1800). Among other books he wrote the following: *Causeries d'un vieillard*, 1807, *Contes à ma fille*, 1809, *Les Adieux du vieux conteur*, 1835. The libretto of Beethoven's *Fidelio* was founded on his *Léonore*, 1798.

Boulak, see BULAK.

Boulanger, George Ernest Jean Marie (1837-91), Fr. politician and soldier, b. Rennes. He entered the army in 1856, and estab. his reputation as a soldier by service in Italy, Cochinchina, and in the Franco-Prussian war. As director of infantry at the War Office, a post to which he was appointed in 1882, he made a name as a reformer. On all sides he became regarded as the man who would avenge the defeats of 1870. In 1884 he had been commander of the army at Tunis, and in 1886 he was appointed war minister. In 1887 he came out of office with the ministry, and was not reappointed. He was, however, given the command of an army corps. B. was now the most popular man in France, and was urged to

run for the presidency. In 1888 he was taken off the list of active officers for various acts of insubordination. He immediately entered politics and started an agitation for the revision of the constitution. It was obvious that he was aiming to establish a dictatorship. Some of his moderate supporters began to be alarmed. He resigned his seat as a protest, and was immediately returned by an overwhelming majority for one of the divs. of Paris. At this point had he struck the threatened blow he might have been successful, but he failed to seize his opportunity, and in April 1889 he fled the country on the issue of a warrant for his arrest on a charge of treason. The Boulangist movement did not survive his exile for very long. In Oct., in his absence, he was condemned for treason. Finally, after settling in Jersey, he committed suicide in 1891 on the grave of his mistress in Brussels.

Boulanger, Pierre Emanuel Hippolyte, see BOULENGER.

Boulangerite (named after one of its discoverers, Boulanger, a Frenchman), a non-crystalline mineral of the colour of lead. It exists in bacillary, amorphous masses, slightly granulated. The formula for B. is $Pb_2Sb_2S_6$ and the sp. gr. 8 to 6.

Boulay de la Meurthe, Antoine Jacques Claude Joseph, Comte (1761-1840), Fr. politician, son of an agric. labourer, b. Chamousey in the Vosges. He became a lawyer and at first supported the revolution. He represented La Meurthe in the Council of Five Hundred. He was known as an opponent of Jacobinism and of the Directory despotism. Under the empire he helped to compile the Civil Code, and was created a count. He was a member of Napoleon's privy council.

Boulay (-Moselle), Fr. tn, cap. of an arron., in the dept. of Moselle. Pop. 2100.

Boulder: 1. Tn of B. co., Colorado, U.S.A. It is situated at the foot of the Front Range on B. Creek. It is the centre of a large mining, stock-raising, and agric. region. The U.S. Atomic Energy Commission plant was begun in 1951 at Rocky Flats. B. is the site of the univ. of Colorado. It is served by the Union Pacific and the Colorado and NW. railways. Pop. 20,000.

2. Australian tn, see KALGOORLIE.

Boulder Clay, or Till, clay containing boulders and stones of various sizes deposited from a glacier or ice-sheet. The fine matrix of the deposit is made of 'rock flour' produced by the abrasion of rocks over which the ice passes, and its composition varies according to the nature of these rocks. Some B. C.s are sandy or chalky. The boulders also vary in composition according to the nature of the parent rocks. A mantle of B. C. covers much of the N. part of the Brit. Is. as well as parts of Scandinavia, Holland, and Germany, and great areas in Canada. The widespread B. C. of N. Europe and N. America was deposited by the great ice sheets of the Glacial or Pleistocene Period. B. C. may be formed in an even layer, in irregular heaps, or in small ovoid hills or drumlins which are aligned parallel to

the direction of ice flow. See GLACIERS and GLACIAL PERIOD.

Boulder Dam (renamed Hoover Dam, 1947), big dam, completed in 1935-6, on the Colorado R., in Black Canyon on the borders of Nevada and Arizona, where the riv. enters on its last pronounced southward reach. The dam is 727 ft above the bed rock and raises the water level in Lake Mead by 584 ft; it is 1282 ft in length along its crest. The total land in all states to be irrigated is some 2 million ac., and the dam holds 10,000,000,000 gallons of water, supplying a generating plant with a capacity of 2,000,000 h.p.



Paul Popper

Boulder Dam

Boulders, Erratic, see ERRATICS.

Bouls, the Athenian council, believed to have been instituted by Solon. It consisted of 500 members divided into 10 sections of 50 each, the members of which were known as prytanies and were all of the same tribe. The prin. duty of the B. was to discuss and prepare measures for submission to the assembly, but it also enjoyed considerable executive powers.

Boule Work, see BUHL WORK.

Boulenger, or Boulanger, Pierre Emmanuel Hippolyte (1838-74), Belgian landscape painter, *b.* Tournai, studied in Brussels Academy and at Tervueren. He worked in much the same spirit as the members of the Barbizon School (q.v.). The institution of the Société Libre des Beaux-Arts (1868) was largely due to his influence, also its jour., *L'Art Libre* (1871).

Boulevard (Fr., cf. Ger. *Bollwerk*; Eng. *bulwark*), term applied to the rampart or outer fortification of a tn. In France,

Germany, etc., these ancient fortifications have frequently been demolished, levelled, and the broad space thus obtained planted with trees and used as a promenade. Hence the term now denotes a broad avenue, designed for walking or driving. The most celebrated B.s are those of Paris.

Boulismia, see BULIMIA.

Boulogne-Billancourt, Fr. tn in the dept of Seine, a SW. suburb of Paris, on the Seine, adjoining the Bois de Boulogne. It has many fine residences, automobile and aircraft works, and chemical and other manufs. Pop. 79,000.

Boulogne-sur-Mer, Fr. seaport and holiday resort on the Eng. Channel, cap. of an arron., in the dept of Pas-de-Calais. It is at the mouth of the R. Liane. To the Romans it was Bononia Gessoriacum. The Normans sacked it in 882. It was united to the Fr. crown by Louis XI in 1477. Henry VIII took it in 1544, but it was restored to the French in 1550. In 1803 Napoleon began to muster an army at B. with the intention of invading England; a 164-ft-high column outside the tn commemorates the event, but the statue of Napoleon with which it was crowned was destroyed in 1944. Until the Fr. Revolution B. was a bishopric; the present basilica of Notre Dame stands on the site of the cathedral then burnt. During the First World War B. was an important Brit. base, and was awarded the Croix de Guerre. In the Second World War it was very badly damaged, over 5000 buildings being demolished, but there has since been a great deal of rebuilding. The tn is in 2 parts: Upper B., the older part, still has its medieval wall; Lower B. is the seaport proper. Across the riv. is the suburb of Capécure, containing the main railway stations. There is a fine beach and good bathing. B. is the first fishing port of France, has a busy coasting trade, and cross-channel and transatlantic services. The chief industries are fishing, fish-curing, boat-building, and the manuf. of textiles, steel, ships' stores, soap, pens, and cement. Sainte-Beuve, Mariette, and the brothers Coquelin (q.v.v.) were *b.* at B., and Le Sage, Thomas Campbell, and Charles Churchill (q.v.v.) *d.* here. Pop. 42,000.

Boulonnais, name of a former div. of France, now situated in the Pas-de-Calais. Its cap. was Boulogne-sur-Mer.

Boult, Sir Adrian (1889-), conductor, *b.* Chester. He was educated at Westminster School and Oxford, where he studied music under Sir Hugh Allen; he later studied at Leipzig under Hans Sitt and Eugen Lidner, and devoted attention to the methods of Nikisch. He was on the music staff, Royal Opera Covent Garden, 1914, and from 1918 conducted for the Royal Philharmonic Society and Liverpool Philharmonic Society, also the London Symphony Orchestra, and Queen's Hall Orchestra. He was on the teaching staff at the Royal College of Music, London, 1919. Conductor of the Birmingham City Orchestra and the Birmingham Festival Choral Society, 1924-30; and 1930-42 was director of music at the B.B.C., remaining with the corporation as chief conductor

of the B.B.C. Symphony Orchestra. He has done fine work, especially for the younger Eng. school of composers. Knighted, 1937. Pub. *A Handbook on the Technique of Conducting*, 1937.

Boulton, Matthew (1728-1809), engineer, b. Birmingham. He succeeded (1759) to his father's business of silver stamper and piercer. So great were his improvements and extensions that in 1762 he removed his works to Soho, just N. of Birmingham. A new method of inlaying steel was one of his first achievements. He formed a partnership with the great James Watt (1775). They joined in improving coining machinery, and produced a new copper coinage for Great Britain in 1797. That same year a patent was granted B. for his method of raising water by impulse. Consult S. Smiles, *Lives of Boulton and Watt*, 1865, and H. W. Dickinson, *Matthew Boulton*, 1936.

Bounding Bett, see SOAPWORT.

Boundary (O.F. *badne*, *bonde*; medieval Lat. *badena*, from *butina*, frontier line), that which marks the limit of land. The B. may be indicated by a post, ditch, hedge, march of stones, road, or riv., or it may be indicated by reference to a plan, or to possession of tenants, or by actual measurement. When 2 properties are divided by a road or riv., the middle line of the road or riv. is regarded as the B. between the owners (*usque ad medium flui*); whereas a hedge or fence is taken to belong equally to the adjoining owners. The B.s of tns and pars. depend upon anct charter or custom. The Local Government Acts of 1888 and 1894 provided for the readjustment of local areas, subject in certain cases to the confirmation of Parliament. The Reform Acts of 1832, 1867, and 1884 defined political B.s, which frequently differ from municipal ones. In law, the exact B., whether public or private, is a matter of evidence, and where there is no evidence the court acts on presumption. The presiding authority of a local board in England, or of a police bor. in Scotland, finally defines the B., which is then publicly recorded. In Scotland, a bounding charter describes the limits of land.

Bounds, Beating the, or Perambulation, custom common to sev. European nations under different forms. In England, on Holy Thursday or Ascension Day, the vicar, with some officers and boys, walked in procession to each of the different par. boundaries, where the boys beat the boundaries with peeled willow-wands in order to remember their location. Sometimes the boys themselves were beaten and received a little money for their pains. This ceremony may be compared with the Rom. Terminalia, celebrated on 23 Feb. In Scotland, alternative names are 'riding the marches' and 'common riding.' At Shrewsbury it was called 'bannering,' and the custom was kept up till the middle of the 19th cent. Since then there has been a revival of the custom in some pars., including some in the city of London. See Brand's *Popular Antiquities*.

Bounty, in political economy, a sum granted directly or indirectly by a gov.

to producers, manufacturers, etc., for the purpose of encouraging the particular industry, usually taking the form of a subsidy on quantities of goods exported from the country. B.s, or subsidies as they are also termed, were used much in Great Britain under the former mercantile system, examples being those on the herring fisheries, which, it is said, cost the state more than the price of the herrings as sold in the open market; the linen export B.s were abolished in 1834; and the corn export B.s abolished in 1814. Foreign countries which frankly adopt a protectionist standpoint still grant B.s to stimulate industries of importance to the country apart from their commercial value, e.g. the Fr. shipping B.s, as a support for the navy; but, with one exception, the sugar B.s (see BRUSSELS SUGAR CONVENTION), state trade subventions usually take more indirect methods, in the form of rebates, drawbacks, etc. From 1918 the Brit. Gov. gave a temporary B. to the growers of sugar-beet. From the point of view of economics, B.s are objected to as penalising the consumer, the taxpayer, to benefit an individual trade; as withdrawing capital to an industry which without the B. would decline, and should therefore be regarded as doomed to extinction; and, as proved by past hist., B.s have been in themselves unnecessary or even harmful, as in the case of the linen B.s and herring fishery B.s. Apart from economic B.s, the word is applied to the money premiums formerly paid on enlistment for the army and navy in Great Britain and Ireland, which varied in amount during the great Napoleonic wars from £18 to over £20 a head. In the old militia forces B.s of £2 were paid on enlistment. B.s, or 'B. money,' are paid to a mercantile ship's crew for salvage service, and payments were made to the crew per head for slaves taken by a Brit. ship from a slaver. The queen's B. is a donation of £3 granted by the sovereign to the mother of triplets.

'Bounty,' Mutiny of the. H.M.S. *Bounty* was an Eng. vessel sent out in 1787 to Tahiti, under Wm Bligh (q.v.), to collect plants of the bread-fruit tree for the W. Indies. On the return voyage Bligh's crew mutinied under his harsh treatment, turning him and the few who were loyal to him adrift. They finally reached land in safety. Of the mutineers some returned to Tahiti and were captured and punished; the rest settled on Pitcairn Is. (between S. America and Australia) in 1790. There were quarrels with the native Tahitians, and massacres took place, in which most of the Englishmen were murdered as time went on. Gradually, however, a little colony was formed under the surviving Englishman, John Adams, who d. in 1829. Lord Byron used this incident in *The Island*. See Wm Bligh, *Voyage to the South Sea in the 'Bounty,' the Mutiny, and Voyage to Timor*, 1792; Sir John Barrow, *The Eventful History of the Mutiny of H.M.S. 'Bounty,' 1831*; H. V. Evatt, *Rum Rebellion: Overthrow of Governor Bligh*, 1938.

Bounty, Queen Anne's, an Eng. eccles.

fund, founded in 1703, the tithes, etc., originally paid to the Pope, and later to the Crown, being reserved for it. Its purposes are to augment small livings, to build parsonage houses, and generally to make grants for eccles. purposes. It is now administered by the Eccles. Commissioners.

Bounty Islands, small uninhabited is. included in the boundaries of New Zealand. They lie to the SE. of S. Is. at about 48° S. and 180° W.

Bourassa, Henri (1868-1952), Canadian journalist and parliamentarian, b. Montreal, son of the Canadian author, artist, and architect Napoléon B. (1827-1916); grandson of Louis J. Papineau. Elected 1896 to Dominion House of Commons as a Liberal, he resigned in 1899 as a protest against Canadian participation in the Boer War and was triumphantly re-elected as a 'Nationalist.' In 1907 he left the Dominion Parliament to enter the Quebec Legislature, of which he was member 1908-12. In 1910 he estab. *Le Devoir*. His Quebec Nationalist following joined forces with Ontario Conservatives to defeat Laurier in 1911, but he bitterly opposed the Conservative policy of conscription in the First World War. He sat again in the House of Commons 1925-35. B. left a strong mark on political thought in Quebec.

Bourbaki, Charles Denis Sauter (1816-1897), Fr. general, b. Pau, educ. at Saint-Cyr; entered the army in 1836, and served in Algeria, the Crimea, and Italy, distinguishing himself particularly at Alma and Inkerman (1854), and at Solferino (1859). In the Franco-Ger. War, he commanded the Imperial Guard and took a prominent part in the fighting round Metz, after which he was sent on a secret mission to the Empress Eugénie in England. For a short time he was at the head of the army of the N. He met with a severe repulse at Belfort (1871), and on his retreat attempted suicide. He became corps-commander at Lyons in the same year, and retired in 1881. See Grandin, *Le Général Bourbaki*, Paris, 1897.

Bourbon, Fr. family which occupied the thrones of France, Naples, and Spain. The family can trace their descent back to the early part of the 10th cent. The name B. is taken from the territorial possessions of a certain Adhémar, lord of the barony of Bourbonnais, a ter. lying away in the centre of France and represented by the modern dept of Allier. The family of B. early in his hist. became allied by marriage to the house of Dampierre, and in 1272 it became allied by marriage to the royal Capetian house, by the marriage of Agnès, heiress of the house of B., with the sixth son of Louis IX. The son of this marriage received the title of the Duke of B., but before the end of the 15th cent. this line had become extinct, and the duchy had passed into the possession of another branch of the family. With the great constable, Charles de B., the direct line from the first B. duke came to an end. A younger branch of the line took up the title in the person of Louis, Duke of Vendôme, and in direct descent from him

was Antoine (q.v.), King of Navarre by marriage, and heir to the B. title and name. His son was the famous Henry of Navarre who in 1589 became King of France as Henry IV (q.v.). Henry IV was assassinated in 1610, and was succeeded by his son, Louis XIII, who d. in 1643, and was succeeded by his son, the 'grand monarque,' Louis XIV. He was succeeded by his great-grandson Louis XV, but before his death had succeeded in establishing the B. dynasty upon the throne of Spain. Louis XV d. in 1774, and was succeeded by his grandson, Louis XVI, who met death on the scaffold during the revolution in the year 1793. His son was nominally Louis XVII, and after the Napoleonic wars his brother was restored to the throne of France as Louis XVIII. He was succeeded by his brother, Charles X. Charles X's grandson was styled the Count of Chambord, and on his death in 1833 the supporters of the B. family in France accepted as the head of the house of B. the Orleanist, Louis Philippe, Count of Paris. He d. in 1834, and his position was taken up by his son (d. 1926). He left no son, and the claim to the Fr. throne then passed to John, Duke of Guise, and then to his son, Henry, Count of Paris (b. 1908). Before this date, however, the Orleanist branch of the B. family had placed one of their number on the throne of France. The Orleanists were descended from the brother of Louis XIV. Amongst the more prominent members of that section of the family may be mentioned, Louis Philippe, 'Egalité,' whose son became King of the French for a short time in the 19th cent. The 2 other important branches of the family are the Sp. and the Neapolitan. The Sp. dynasty was founded practically by Louis XIV, whose scheme for a union between the 2 countries failed, but who succeeded in placing his grandson, Philip of Anjou, on the throne in the place of the dead Charles II. Philip of Anjou became King Philip V of Spain, he was succeeded by his son, Ferdinand VI, and he in turn was succeeded by his brother, Charles III. He was succeeded in 1788 by his son, Charles IV, whilst his second son became King of the Two Sicilies. Charles IV was deposed by Napoleon, this deposition being one of the chief causes of the Peninsular war, but after the wars the throne was restored to the son of Charles IV in the person of Ferdinand VII. In 1833 he was succeeded by his daughter Isabella, and his brother Carlos, Duke of Madrid, claimed the throne by right of Salic law, the resulting quarrel starting a long period of sporadic civil war between the rival factions. Isabella abdicated in 1870, and was succeeded by her son, Alfonso XII, who d. in 1885, and was succeeded by his posthumous son, Alfonso XIII (abdicated 1931). The first of the B. family to have the sovereign rights of the kingdom of Naples was Charles III, who on his succession to the Sp. throne passed these rights on to his second son, Ferdinand I. Ferdinand, at one time deposed by Napoleon, afterwards regained his kingdom and took the title of King of the Two

Stollies. He was succeeded in 1825 by his son, Francis I, who held the same title as his father, and he in turn was succeeded by his son, Ferdinand II. Francis II, who succeeded him, was deprived of his possessions, which were incorporated in United Italy. Another branch of the family is the Parmese branch, which held the titles of Dukes of Lucca and Parma. The duchy of Parma came into the B. family in 1748, when by the treaty of Aachen it was conferred on the youngest son of Philip V of Spain. It was held by this branch of the family until 1860, when the duchies were annexed by Victor Emmanuel to the kingdom of Italy. Other branches of the B. family are the Vendôme branch, descended from a natural son of Henry IV, and the families of Condé, Conti, and Montpensier.

Bourbon, Charles, Duc de (1490-1527), Fr. noble, usually styled the Constable de B., the second son of Gilbert, Count of Montpensier. By marriage with the heiress of the B. estates, and by the death of his elder brother, he became the wealthiest and most powerful noble in France. His conduct at Marignano (1515) gained for him the title of constable of France, and he was also made the Governor of Milan. But his wealth and his influence made him many enemies at court, who, after the death of his wife, seem to have been led by the queen mother. His estates were confiscated, and B. turned against France and entered the service of Charles V. In 1524 he commanded Charles's armies in Italy, helping to drive the French from the country, but failing in the action before Marseilles. He also took part in the battle of Pavia (1525). In 1526 he was given the duchy of Milan. In 1527 his troops, composed of Spaniards and Ger. Protestant mercenaries, clamouring for their arrears of pay, were led against Rome. Rome was attacked and stormed, and in the storming of the walls B. was killed. After his death Rome was sacked by his starving and mutinous troops. See life by C. Hare, 1911.

Bourbon, Duke of Vendôme, see AN-TOINE.

Bourbon, Henry I and II of, see CONDÉ, PRINCE DE.

Bourbon, Louis Antoine de, see ANGOU-LEME, DUKE OF.

Bourbon, Louis I and II de, and Louis Joseph de, see CONDÉ, PRINCE DE.

Bourbon, Ile, see RÉUNION.

Bourbon-Lancy, Fr. tn in the dept Saône-et-Loire, noted for mineral springs dating from Rom. times. Pop. 4600.

Bourbon-L'Archambault, Fr. tn in the dept of Allier, on the Burgues. It is a spa, and has the ruins of the medieval castle of the lords of B., from whom sprang the royal family (see **BOURBON**). Pop. 2800.

Bourbon-Vendée, see ROCHE-SUR-YON, LA.

Bourbonnais, anct. prov. of central France, corresponding to the present dept of Allier, with parts of Cher, Puy-de-Dôme, and Creuse. Its cap. was Moulins (q.v.). It formed the duchy of Bourbon from 1327 to 1527, when it was united

with the crown. In 1661 it was given to the house of Bourbon-Condé, who held it till the revolution. (See **BOURBON**.)

Bourbonne-les-Bains, Fr. spa in the dept of Haute-Marne. The Romans called its thermal springs *Aquae Borvoni*. There is a 12th-cent. church and the ruined château of the seigneurs de Bourbonne. Pop. 2700.

Bourchier, Arthur (1864-1927), actor-manager, b. Berks, educ. at Eton and Oxford, where he founded the O.U.A.D.C. His first professional appearance was with Mrs Langtry in 1889, as Jacques in *As You Like It*. Other of his Shakespeare characters were Shylock, Henry VIII, Macbeth, Macduff, Sir Toby Belch, and Falstaff. He toured with Daly's company in America, returning to England in 1893, and married the actress, Miss Violet Vanbrugh, in 1894. He acted with Sir Charles Wyndham as Joseph Surface in *The School for Scandal*. For a time he was Sir C. Wyndham's partner at the Criterion, appearing with him in *David Garrick*. In later years he was manager of the Garrick Theatre and of the Strand Theatre.

Bourchier, John, see BERNERS, JOHN.

Bourchier, Thomas (c. 1404-86), Eng. archbishop, educ. at Oxford. He became Bishop of Worcester in 1434; Bishop of Ely, 1443; and in 1454 was made Archbishop of Canterbury. He was lord chancellor 1455-6. B. supported the Lancastrians at the beginning of the Wars of the Roses, but from 1461 supported Edward IV, whom he crowned. He also crowned Richard III and Henry VII. He was made a cardinal in 1467.

Bourdaloue, Louis (1632-1704), Fr. priest, b. Bourges, 20 Aug. He entered the Society of Jesus when 16, and was later appointed prof. of rhetoric, philosophy, and moral theology in various Jesuit colleges. He began preaching in 1666, and had an immediate success. In 1669 he was recalled from the provs. to preach in Paris, where his eloquence soon caused him to be ranked with the great men of the period. His sermons at Versailles were so much appreciated that he was asked to deliver Advent and Lenten sermons on at least 7 other occasions, whereas usually the same preacher never came more than 3 times to court. When the Edict of Nantes was revoked he went to Languedoc to confirm the new Catholic converts, and performed this mission tactfully. Towards the close of his life he devoted himself to charitable institutions, where his discourses were welcomed. Voltaire thought his sermons surpassed Bossuet's; they were remarkable for their severe but simple morality, devoid of over-elaboration. B. was a far greater orator than writer, and preached morality rather than dogma. Père Bretonneau's ed. of his sermons is reliable. For his life see Anatole Feugère, *Bourdaloue, sa prédication et son temps* (Paris), 1874, or Sainte-Beuve, *Causeries du Lundi*.

Bourdeaux, see BORDEAUX.

Bourdelle, Émile Antoine (1861-1929), Fr. sculptor, trained at Toulouse and Paris, and strongly influenced by Falguière and Rodin. His first notable work

was 'Adam après la faute,' exhibited in 1883. In 1912 he was given the work of decorating the Théâtre des Champs-Élysées, and also designed for the State factory of Gobelins tapestries. His most important monuments include 'The Virgin of Alsace,' 'The Epic of Poland,' 'Rodin travaillant à la porte de l'enfer,' besides busts of Sir James Frazer in the Royal Academy and of Beethoven in the Luxembourg collection.

Bourdon, Sébastien (1616-71), Fr. painter, b. Montpellier. He studied at Paris and Rome, and returning to Paris became one of the founders and later rector of the Royal Academy of Painting. In 1652 he was appointed court painter in Sweden. While known for his historical paintings, he produced a great variety of works and excelled in landscape. His masterpiece is the 'Martyrdom of Saint Peter,' in the Louvre, where sev. of his works are hung.

Bourdon de l'Oise, François Louis (1750-1797), Fr. revolutionary, b. Saint-Rémy, near Compiègne. He took part in the storming of the Tuilleries (1792), and played a leading part in the events leading to the execution of Louis XVI and the destruction of the Girondists. He later sided with the Moderates, and helped in the overthrow of the Terrorists (1794). He became a member of the Council of Five Hundred. His Royalist leanings brought him under suspicion, and in 1797 the Directory transported him to Cayenne, where he d.

Bourdonnaux, Bertrand-François, Comte Mahé de la (1699-1753), Fr. sailor and administrator, b. St. Malo. As a naval officer in the service of the Fr. E. India Co. he took a prominent part in campaigns against the fortified seaports of India, including the capture of Mahé (1725), and later served in the Fr. Navy, commanding a squadron and rescuing Pondichéry and Mahé (1741-2). In 1746 he won a naval victory at Negapatnam and captured Madras. But he is best remembered as a colonial administrator. From 1735 to 1740, and again from 1742 to 1746, he was governor-general of the Îles de France et de Bourbon (Mauritius and Réunion). There he supervised the building of the tn of Port Louis and the design and completion of its harbour works, the building of roads, and the development of agriculture, especially of the sugar-cane industry. In 1747, after disagreeing with Dupleix, who commanded the Fr. troops in India, he was recalled to France and imprisoned in the Bastille. His trial (1751), after 2 years of imprisonment, cleared him of all charges.

Bourg (-en-Bresse), Fr. tn, cap. of the dept of Ain, on the Reyssouze. It was the anct cap. of Bresse (q.v.). In the suburb of Brou is a celebrated flamboyant church, containing magnificent monuments. Lalande (q.v.) was b. here. There is considerable trade in horses, cattle, poultry, and grain, and manufs. of copperware. Pop. 26,500.

Bourg-Dieu, see DÉOLS.

Bourg-St-Andéol, Fr. tn in the dept of Ardèche, on the Rhône. It is a

picturesque tn, with a remarkable Romanesque church. It has a trade in pottery and wine. Pop. 3400.

Bourg-sur-Gironde, Fr. tn in the dept of Gironde, on the Dordogne. It is a picturesque tn, at the foot of a cliff, and with many anct buildings. It has vineyards and quarries. Pop. 2100.

Bourgageuf, Fr. tn in the dept of Creuse. It has sev. anct buildings, including a castle built for a brother of the Sultan Bajazet II (q.v.). It has a market. Pop. 3500.

Bourgelat, Claude (1712-79), Fr. veterinary surgeon, at first a barrister and then a musketeer, founded in 1761 a veterinary school at Lyons, the first of its kind in Europe. He was director also of the second, estab. in 1765 at Alfort. He made a study of the anatomy of domestic animals, and raised an art that had been empirical to the rank of a science.

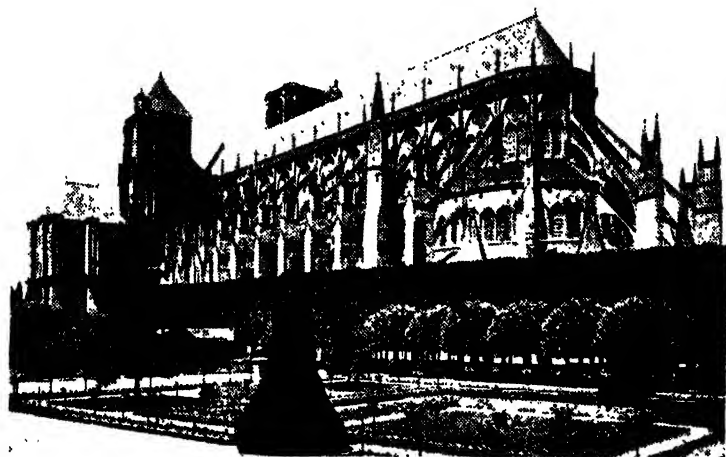
Bourgeois, Léon Victor Auguste (1851-1925), Fr. statesman, b. Paris; educ. for the law. He was made prefect of police in 1887, and began his political career the following year when he defeated Boulanger by a great majority and entered the Chamber as a Radical deputy for Marne. He was under-secretary for home affairs in 1888, minister of the interior in 1889, and minister of public instruction in 1890. From 1895 to 1896 he was Premier. He was minister of public instruction in 1898, and in 1903 represented France at The Hague Peace Congress. He became a senator in 1905, and minister for foreign affairs in 1906. His services were frequently invoked in arbitration or agreements between France and other states, and in interparty compromises. In 1918 the Fr. Gov. appointed him chairman of a foreign office committee on the League of Nations. He was chairman of the drafting committee in 1919, and in that capacity had a great deal to do with the form in which the League scheme was finally presented to the allied nations. He was one of the Fr. delegates on the Inter-Allied Peace Conference to Paris, 1919. He was awarded the Nobel peace prize in 1920. See Maurice Hainburger, *Léon Bourgeois* (biography from Radical-Socialist point of view), 1932.

Bourgeois, Sir Peter Francis (1756-1811), Eng. painter, son of a Swiss clock-maker. He became R.A. in 1793, and is famous for his bequest of a valuable collection of pictures to Dulwich College, and a large sum of money for the upkeep and extension of the galleries. Two noted works are 'Kemble as Coriolanus' and 'Hunting a Tiger.'

Bourgeoisie, Fr. word, applied to the middle-class citizens of a tn as distinct from the nobility and the working classes. The term is often used contemptuously, implying smug respectability (as in 'petit bourgeois'), and more generally to identify the capitalist 'class' as a whole. The B. figures prominently in Marxist economic and sociological analysis. See references in BOLSHEVISM; COMMUNISM; ENGELS, FRIEDRICH; MARX, HEINRICH KARL.

Bourges (anc. *Avaricum*), Fr. city, cap. of the dept of Cher, and former cap. of Berri (q.v.), 144 m. S. of Paris. It stands on the canal du Berry, and on the Yèvre, a trib. of the Cher (q.v.): the surrounding dist., once marshy, now has rich market gardens. B. was once the cap. of the Bituriges Cubi (q.v.), and later an important tn of Aquitania (q.v.). After the battle of Agincourt (q.v.) in 1415 it was the centre of Fr. power: Charles VII (q.v.) was ironically called 'the king of B.' The Pragmatic Sanction (q.v.) of 1437 was promulgated here. The fine Gothic

1935), Fr. novelist and critic, b. Amiens, and studied at the college of Sainte-Barbe, Paris, where he graduated brilliantly in 1872. Three vols. of verse—*La Vie inquiète*, 1875, *Edel*, 1878, and *Les Aveux*, 1881—were among his earliest contributions to literature. Greatly indebted to Taine, B. is essentially a psychologist. His critical studies, *Essais*, 1883, and *Essais de psychologie contemporaine*, 1886, are singularly subtle in analysis. His first novel, *L'Irréparable*, 1884, was quickly followed by others (*Cruelle Enigme*, 1885, *André Cornélis*, 1887, and *Le Disciple*,



THE CATHEDRAL OF ST ÉTIENNE, BOURGES

R.N.A.

archiepiscopal cathedral (1200-60) is one of the most notable churches in Europe, and contains beautiful medieval glass. Other interesting buildings are the house of Jacques Cœur (q.v.), which is considered to be one of the best examples of Fr. secular Gothic architecture, and the Renaissance house of Jacques Cujas (q.v.), which is now a museum. The univ. of B., founded in 1463, was suppressed at the revolution. The tn has ordnance, engineering, and textile industries, and a trade in wool and wine. Pop. 53,900.

Bourges-Maunoury, Maurice (1914-), Fr. politician. After a distinguished record with the Fr. Resistance during the Second World War, he entered the Constituent Assembly as a Radical-Socialist in 1946. He held office in various post-war Fr. govts, and succeeded Mollet (q.v.) as Premier in June 1957, resigning on 30 Sept.

Bourget, Paul Charles Joseph (1852-

1889), which placed him in the front rank of modern novelists. They show an extraordinary insight into 'states of soul' and the morbid, cynical interest of a dilettante in psychological situations. He travelled widely and was a cosmopolitan by instinct (his father was a Russian, his mother an Englishwoman)—facts which account for his intimate knowledge of mixed society of all nationalities. He pub. impressions of his travels in *Outre-Mer*, 1895, and *Études et portraits*, 1888. Other publs. include *Nouveaux Pastels*, 1890; *Sensations d'Italie*, 1891; *Psychologie de l'amour moderne*, 1891; *L'Étape*, 1902; *L'Émigré*, 1907; *Le Démon de midi*, 1914; *Le Sens de la mort*, 1915; *Un Draine dans le monde*, 1921; *Nos actes nous suivent*, 1927. He became a member of the Fr. Academy in 1894. See E. Seillière, *P. Bourget, psychologue et sociologue*, 1937, and W. T. Secor, *P. Bourget and the Novel*, 1948.

Bourget, Lac du, Fr. lake in the dept of Savoie, near Aix-les-Bains. It is 11 m.

long and about 2 m. wide. It is Le Lac of the poem by Lamartine.

Bourget, Le, Fr. tn in the dept of Seine, on the N. outskirts of Paris, 7 m. from the centre of the city. The French were defeated here in 2 battles in 1870 (see FRANCO-GERMAN WAR). The large airport of Le B. is one of the prin. commercial airports in France. Pop. 7300.

Bourgogne, see BURGUNDY.

Bourgoin, Fr. tn in the dept of Isère, on the Bourbre, a trib. of the Rhône (q.v.). It has textile and engineering industries. Pop. 7700.

Bourguignon, Le, see COURTOIS, JACQUES.

Bourignon, Antoinette (1616-80), Flem. mystic, b. Lille; a religious enthusiast from her earliest years, she was subject to strange hallucinations and visions. Ardent for reform and the original purity of the Gospel, she won numerous disciples and as many foes. She was banished from her country, and travelled in Belgium, Holland, and N. Germany. She also visited France, England, and Scotland, preaching reform. Her followers soon dwindled away after her death, but her influence was felt again in Scotland in the 18th cent., and was denounced by the Presbyterian general assemblies of 1701, 1709, and 1710. Her writings were pub. by Pierre Poiret, her disciple, at Amsterdam, 1679-84. Three have been trans. into English: *An Abridgement of the Light of the World*, 1696, *A Treatise of Solid Virtue*, 1699, and *The Restoration of the Gospel Spirit*, 1707.

Bourinot, Sir John George (1837-1902), Canadian historian, became clerk to the Canadian House of Commons in 1880. His works cover the whole field of Canadian hist. The best known of his works is *Parliamentary Procedure and Practice in Canada*, 1884, which is a standard work on the subject. His other works include *Canada*, 1885, in the Story of the Nations series; *Builders of Nova Scotia*; *Canada under British Rule*; and *Constitutional History of Canada*, etc.

Bourke, Richard Southwell, 6th Earl of Mayo (1822-72), statesman, b. Dublin and educ. at Trinity College there. He was appointed Viceroy of India in 1869, and reorganised the finances of the country and promoted many useful public works. He helped to preserve the autonomy of Afghanistan. He was assassinated at Port Blair, Andaman Is.

Bourke, tn in New S. Wales, Australia, situated on the Darling R., 500 m. by rail from Sydney. The dist. is the centre of a large grazing area. Pop. 3000.

Bourlon Wood, small wood W. of Cambrai in N. France; the scene of fighting in Nov. 1917 during the First World War. Owing to allied activity in Flanders, the Germans had been gradually weakening various parts of the W. front to reinforce their line towards its N. extremity, and in Italy. Cambrai was one of the points so weakened, and the Allies therefore decided to make an advance in this sector. It was decided to dispense entirely with a preliminary artillery bombardment, and to rely on numerous tanks. The task was

not an easy one, notwithstanding the element of surprise, for the Germans persistently counter-attacked, causing some positions to change hands sev. times. The Germans fully appreciated the importance of B. W. as a key position and eventually brought up overwhelming odds against the British, who were compelled to evacuate it on 4 Dec. 1917, and withdraw to a more defensible line.

Bourmont, Louis Auguste Victor de Ghaïnes, Comte de (1773-1846), Fr. marshal, b. Château de Bourmont, in the dept of Maine-et-Loire. He fought on the side of the Royalists under Condé; he went into exile from 1793 to 1799, and took an active part in the struggle in La Vendée. He was imprisoned on a charge of intrigue at Beaumont, but escaped to Portugal. Later he won the favour of Napoleon, and for his services in Naples, Russia, and Germany (1808-14) was promoted to the rank of general. He vacillated between Louis XVIII and Napoleon, deserting the latter before the battle of Ligny. In 1829 he was appointed minister of war, and in the following year took command of the expedition to Algeria, in which he was successful. He refused to take the oath of allegiance to Louis Philippe, and was deprived of his peerage and his command in the army. He served Dom Miguel, King of Portugal, for a time, and d. at his castle at Bourmont.

Bourne, Edward Gaylord (1860-1908), Amer. historian, b. Strykersville, New York. Author of *The Surplus Revenue of 1837*, 1885, *Essays in Historical Criticism*, 1901, and *Spain in America*, 1904. He also ed. the narrative sources for *De Soto*, 1904, *Champlain*, 1905, and *The Northmen, Columbus, and Cabot*, 1906.

Bourne, Francis, Cardinal (1861-1935), b. Clapham, 23 Mar.; educ. at St Cutlbert's College, Ushaw, St Edmund's, Ware, Saint-Sulpice, Paris, and the univ. of Louvain. Ordained priest, 1884; served as curate at Blackheath, Mortlake, and W. Grinstead in succession. He was the founder in 1889, and the first head, of a theological seminary in the diocese of Southwark, of which he was made bishop in 1897. He had previously, in 1895, received the appointment of domestic chaplain to the Pope. When Cardinal Vaughan d. in 1903 B. succeeded him as Rom. Catholic Archbishop of Westminster. From a national point of view, the most striking event of his career as archbishop was in connection with the Eucharistic Congress of 1908. The Host was to have been carried through streets in Westminster on Sunday, 13 Sept., but representations made by the gov. that this would be illegal prevented it at the last moment. B.'s correspondence on this matter with the Prime Minister, Asquith, is a masterly example of his diplomatic gifts. He was created cardinal in 1911.

Bourne, Hugh (1772-1852), joint founder, with Wm Clowes, of the sect of Primitive Methodists. He was b. Fordhays, Staffs; began life as a carpenter. He became a Wesleyan Methodist local preacher, but his zeal for open-air meetings

did not meet with the approval of that body, and his repeated defiance of the resolutions of the Wesleyan Methodist Conference resulted in his expulsion from the society in 1808. His evangelical style of preaching was popular, and he gathered round him many followers, through whom he estab. a new denomination, which adopted the name of Primitive Methodists in 1812. B.'s first chapel was founded at Tunstall in 1811, and the first ann. conference at Hull in 1820. He visited Scotland, Ireland, Canada, and the U.S.A., and before his death the members' roll numbered 110,000. He pub. the *History of the Primitive Methodists*, 1823. See J. Walford, *Memoirs*, 1855.

Bourne, Vincent (1695-1747), Eng. classical scholar and poet. Went from Westminster to Trinity College, Cambridge, finally becoming a master in his old school. Pub. Lat. poems of poetic as well as linguistic merit. His pupil, Cowper, ranked him as high as Ovid. Lamb also has praised his Lat. verse. The best ed. of his *Poemata* (1840) has a memoir by John Mitford.

Bourne, mkt tn in the Stamford par. div. of Lincs, England, 95 m. N. by W. of London. It has an Early Eng. church which belonged to a foundation of Augustinian canons of 1138. It has an agric. trade; it is also famous as having been the stronghold of 'Hereward the Wake,' Pop. 5200.

Bournemouth, watering-place and winter resort on Poole Bay, off the coast of Hants, England, 25 m. S.W. of Southampton. It received its charter of incorporation in 1890, became a co. bor. in 1900, a par. bor. in 1918, and a registration area (with Christchurch), 2 bor. constituencies, in 1948. Its sheltered position in a pine valley, and its even temp., have made it a favourite winter resort for invalids. The sanatorium for consumptives was built in 1855, and there are numerous hospitals and convalescent and nursing homes. In the churchyard of St Peter's are buried Godwin, Mary Wollstonecraft, and Mary Shelley. B. has a fine stretch of sands, parks, winter gardens, 2 piers, one 1000 ft long, and golf-courses. The Undercliff Drive is now 1½ m. long, making a total promenade length of 4½ m. The Russell-Cotes Museum and Art Gallery is situated in B., which also has free libraries and 2 large boarding-schools for girls. During the season steamers ply between B. and other centres on the mainland and the Isle of Wight. Yachting in Poole Harbour is popular among the visitors. Outside the tn an aerodrome has been erected, which is available for civil aviation. The Pavilion, comprising theatre, dance halls, etc., was opened in 1929. The area of B. until 1930 was 6643 ac.; but this was nearly doubled in that year by amalgamating with the bor. the pars. of Kinson and Holdenhurst and the open space known as Hengistbury Head (357 ac.). With these additions the bor. area is 11,627 ac., and its coastline is now 7 m. The par. of Kinson is notable for an anct church, about which clings the tradition of

smuggling days. This is the sixth extension of B. in the past half-cent. or more, in which period B. has grown from an insignificant tn to be one of the largest seaside resorts in the country. Tn-planning schemes were successfully carried out in order to safeguard development under the extension, to make B. one of the most attractive watering-places in Europe. Pop. 144,730.

Bournonite, copper lead antimony sulphide, (CuPbSbS₃). It is an opaque mineral, of a dull grey colour, with bright metallic lustre. It occurs in tabular, orthorhombic crystals, which sometimes form wheel-shaped, twinned growths; hence the miners' name 'cog-wheel ore.' It is first mentioned by Philip Rashleigh in 1797; later, in 1804, by the Comte de Bournon, from whom it derived its name, though Bournon himself named it Endellion, after the place in Cornwall where it was first found. It is also to be found at Neudorf in the Harz, Germany, and in a few other localities.

Bournville, dist. within the boundary of the city of Birmingham, England, an early and distinguished example of tn planning, where a model vil. and factory were founded by George Cadbury (1839-1922). The estate is now administered by the B. Vil. Trust.

Bourrée, dance of Fr. origin, in vogue in France under Louis XIV. It was similar to the gavotte, but is somewhat faster and differs from it by beginning at the last quarter of the bar, not at the half-way. The dance called B., which is still popular in Auvergne and Anjou to the music of the musette or to that of the hurdy-gurdy, seems quite different. It is generally in 3-4 time, but occasionally in 2-4. As a musical form B.s are often found in the suites of the older composers, such as Bach.

Bourrienne, Louis Antoine Fauvelet de (1769-1834), Fr. diplomat, b. Sens. He became friendly with the future Napoleon I at the military school at Brienne. He became secretary of the embassy at Stuttgart, 1792; secretary to Napoleon, 1797, whom he accompanied to Italy and Egypt. He was appointed a councillor of state in 1801, but was dismissed from office in the following year on a charge of peculation. In 1805, however, he was sent as *chargé d'affaires* to Hamburg, but was recalled on account of his dishonest transactions, and was obliged to refund a million francs to the public treasury (1810). He then deserted Napoleon and supported the Bourbons, and sat in the Chamber of Representatives (1815). He d. in a lunatic asylum at Caen. His *Mémoires sur Napoléon* (10 vols., Paris, 1829) are unreliable and spiteful.

Bourrit, Marc Théodore (1735-1819), Swiss artist and naturalist, b. Geneva. He made numerous excursions in the Alps, and devoted all his energies to their study. He was the first to make an attempt to climb Mont Blanc, which he did in 1784, but he did not succeed until 3 years later, after Balmat and Saussure had done so. His chief works are *Description des glaciers du duché de Savoie*, 1774, *Description des aspects du Mont*

Blanc, 1776. *Description des Alpes pennines et rhétiennes*, 1781, and *Description des cols et passages des Alpes*, 1803.

Bourse, name applied on the Continent to a stock exchange, money market, or any place where merchants resort. The Royal Exchange of London was originally called Gresham's Bourse; it was built at his own expense by Sir Thomas Gresham (1566-7) on the model of one at Antwerp. The Paris B. was designed by Brongniart (1808) and was completed by Labarre (1827).

Bouscat, Le, Fr. tn in the dept of Gironde, a NW. suburb of Bordeaux (q.v.). It has a coast wireless station, and a trade in market garden produce and wines. Pop. 18,000.

Boussac, Fr. tn in the dept of Creuse, on the Petite-Creuse. It is a picturesque tn. and has a 15th-cent. castle. Pop. 1400.

Boussingault, Jean Baptiste Joseph Dieudonné (1802-87), Fr. chemist. He studied at the School of Mines of Saint-Étienne; served under Gen. Bolívar in the S. Amer. war of independence; on his return to France became prof. of chem. at Lyons. In 1839 he became a member of the Institute and prof. of agriculture in the Conservatoire des Arts et Métiers, Paris. In 1876 he was made grand officer of the Légion d'Honneur. He won fame for his experimental investigations in agric. science. Pub. *Economie rurale* (2 vols.), 1844; new ed. in 3 vols., 1860-4, and 1887-91; trans. into English and German.

Boussu, tn in the prov. of Hainaut, Belgium, 7 m. W. of Mons. In the tn and neighbourhood are coal-mines, smelting works, and copper and iron foundries. Two engagements between the French and the Austrians took place here on 28 April and 4 Nov. 1792. Pop. 12,200.

Boutsens, Pieter Cornelis (1870-1943), Dutch poet and dramatist, b. Middelburg. His first pub. were the sombre verse collections *Verzen*, 1898, and *Praeludien*, 1902, but his later poetry is more classical in structure and inspiration. His rhythm and imagery are of great beauty. He also pub. some very successful trans. from the Greek, and from modern poets, such as Goethe and Novalis. His *Verzamelde Werken* were ed. in 6 vols., 1943-51. See H. J. C. Grierson, *Two Dutch Poets* (includes some trans.), 1936.

Bouterwek, Friedrich (1765-1828), Ger. poet and philosopher. He began by writing novels and verses, then turned to literary hist. and philosophy, adopting ideas first of Kant and later of Jacobi. His chief works are *Geschichte der neuern Poesie und Beredsamkeit*, 1801-19, *Aphorismen nach Kants Lehre vorgelegt*, 1793, and *Ideen zu einer allgemeinen Apodiktik*, 1799.

Bouts, Dirk (c. 1410-75), Dutch landscape and historical painter. Some uncertainty exists about his name, which occurs as Theodorici (Latin) or Thierry B.; often as Thierry de Haarlem, or Stuerbout, though probably he has no connection with that family of painters. B. settled in Louvain (c. 1448), being appointed painter to the tn council (c. 1468). Perhaps a pupil of van Eyck; his

work shows some resemblance to that of Campin and Van der Weyden. In 1468 B. finished 2 large pictures for Louvain tn hall. These (now in Brussels Gallery) illustrate a legend in Godfrey of Viterbo's chronicle praising the virtue of justice, as exemplified in a judgment of Otho III. They are striking and powerful works with life-size figures. In 1468-72 he painted the 'Last Judgment.' Other works are 'The Adoration of the Kings' (Munich), 'St Erasmus's Martyrdom' in St Peter's Church, Louvain, also the 'Last Supper' (c. 1463). The shutters of this triptych are now at Munich, the central leaf at Berlin. Many works formerly attributed to Memline are proved to be B.'s ('History of St Ursula' at Bruges).

Bouts-rimés, pastime in vogue among literary circles during the 17th and 18th cents., particularly in France. One member of the party gives out certain rhyming words, and the rest of the players compose verses, using the given words as their rhyme endings. The amusement was ridiculed by Addison: see *Spectator*, No. 60.

Bouvet, Francois Joseph (1753-1832), Fr. admiral. He distinguished himself in service in the E. Indies in the time of Hyder Ali, and later, in the Napoleonic wars, he commanded a div. of ships at the battle of the First of June, 1794. In 1802 he was sent out to occupy Guadeloupe.

Bouvetoya, is. in the S. Ocean discovered by Bouvet (q.v.) in 1739; explored 1927 and 1928 by Norwegian expeditions, and previously by a Ger. expedition in 1898; visited and accurately charted by S. African naval expedition in 1955. It is most inaccessible. See B. Aagaard, *Fangst og Forskning i Sydshavet*, Oslo, 1930; *Polar Record*, vol. viii, No. 54, 1956.

Bouvier, John (1787-1851), Amer. jurist, b. Codogno, Italy; his family emigrated to Philadelphia, 1802; became an Amer. citizen, 1812; admitted to the Bar, 1818; recorder of Philadelphia, 1836; and 1838 till his death associate justice of the court of criminal sessions. He pub. a standard law dictionary and ed. *Bacon's Abridgment of the Law*.

Bouvines, or Bovines, vil. in the dept of Nord, France, 6 m. S.E. of Lille. It is noted as the scene of the victory of Philip Augustus of France over the Emperor Otto IV; John, King of England; and the Count of Flanders, in July 1214. Pop. 600.

Bouxwiller, or Buxwiller, Fr. tn in the dept of Bas-Rhin. It has tile and chemical manufs. Pop. 2600.

Bovet, Daniel (1907-), pharmacologist, b. Neuchâtel, Switzerland, subsequently became a naturalised Italian. He graduated at Genova Univ., 1929, and until 1947 worked at the Pasteur Institute, Paris. Now director of pharmacology dept, Istituto Superiore di Sanità, Rome. In 1935 B. was associated with the introduction of sulphanilamide into clinical use. He was the first to synthesise an antihistamine compound. He has also studied the muscle-relaxing drugs and his work here has led to the introduction of

succinylcholine in modern anaesthesia. His latest work concerns the group of drugs known as tranquillisers. Awarded Nobel prize for physiology and medicine, 1957.

Bovey Tracey, vil. in Devon, England, 8½ m. WNW. of Teignmouth, on the edge of the moors. The Bovey Beds are a deposit of sands, clays, and lignite, due to the degradation of the neighbouring Dartmoor granite. The layer is 200-300 ft thick, and extends from B. T. to Newton Abbot. The geological formation closely resembles that of the Bournemouth Beds or Lower Bagshot. The clay extracted is valuable, and used for pipe and potter's clay. Pop. 3350.

Bovidae, family of mammals included in the order Ungulata and of ruminant habit. The family consists of antelopes, sheep, goats, and oxen, with their different species and varieties, but the different sub-families are not sharply defined or easily separated from one another. They occur in all parts of the Old World and in N. America, but are not native to Australia and S. America. They are artiodactylate (i.e. even-toed), and all the males have horns, these consisting of solid bony extensions of the skull encased in a sheath of true horn. Horns are frequently present, but sometimes absent, in the females. Their chief distinguishing features are their horns, limbs, stomach, and teeth. About 45 genera and 200 species exist, of which most are antelopes.

Bovill, Sir William (1814-73). Judge, noted for his decisions in commercial cases. Called to the Bar in 1841 he joined the home circuit. Q.C., 1855; M.P. for Guildford, 1857. The Partnership Law Amendment Act, which he helped to pass, 1865, is called B.'s Act. B. was solicitor-general, 1866, and vacated office the same year to become chief justice of the common pleas.

Bovines, see **Bovines**.

Bovino, It. tn. in Apulia (q.v.), in the Apennines, 18 m. SW. of Foggia (q.v.). It has an ant. cathedral, and there is a trade in agric. produce, wine, and oil. Pop. 9000.

Bovista, genus of gasteromycetous fungi or small puff-balls (q.v.), differing from *Lycoperdon* mainly in having free capillitium threads, about 10 species of temperate regions. *B. plumbea* and *B. nigrescens* are found on heaths, pastures, etc., in Britain.

Bow, Clara (1905-), Amer. actress, known as the 'It' girl, b. Brooklyn, New York. She began in the cinema in 1922, and was a well-known player in the silent days and also at the beginning of the sound period.

Bow, dist. of London, 3 m. E. of St Paul's, in the metropolitan bor. of Poplar. Chancer's Priores's convent of Stratford-atte-Bow was situated here. It has 3 railway stations.

Bow (at Stratford-le-Bow, E. London). 1744-75/6, factory producing soft-paste porcelain (q.v.), with a bone-ash content.

Bow, see **ARCHERY**.

Bow (Fr. *archet*; Ger. *Bogen*; It. *arco*), by means of which stringed instruments

such as the violin are made to sound. It is made of a thin staff of elastic wood tapering slightly to the lower end, from 29-134 to 29-528 in. in length. It is divided, as a whole, into 5 parts: the stick, the ferrule, the nut, the hair, and the head. The hairs, numbering from 110 to 200 of the best white horsehair, are fastened to the lower end, and their tension is regulated by the nut.

Bow, of a ship, the forepart or stem, which cleaves the water as the vessel moves. A naval architect speaks of the 'U' or 'V' form B.s, referring to the shape of the section, whilst sailors describe various types as being broad or full, and lean or fine, B.s. As 'starboard' and 'port' are used respectively of the right and left sides of the vessel, looking forward it is possible to speak of the starboard and port B.s, which mean, of course, at the stem.

Bow Church, Cheapside, London, originally built in the 11th cent. The surviving crypt is the oldest parochial building in London. Because of this arched crypt the church came to be known as St. Maria de Arcubus, or St Mary of the Arches (or Bow), hence St Mary-le-Bow; and the prin. court of the Archbishop of Canterbury (see **ARCHES**, **COURT OF**) derived its name through using this crypt. The church was destroyed in the Great Fire and rebuilt by Wren in 1670-3, the steeple, one of his finest, being completed in 1680. It was the most famous par. church of the city, and those b. within sound of its bell were called Cockneys (q.v.). It was severely damaged in the Second World War, and is being restored.

Bow Fell (2950 ft), mt in the Lake Dist. (q.v.) of Cumberland, England, 8 m. W. of Ambleside.

Bow-legs (*Genu varum*), a deformity marked by separation of the knees when the ankles are touching. There is usually outward curvature of both femur and tibia. It may occur in one leg only, but is generally found in both. At birth all infants are bandy-legged, but during their first year a gradual change comes, the cartilage hardening to bone. The chief cause is rickets, which retards bone formation. Rickets is now a rare condition, and so therefore is B. Other causes are occupations of certain kinds (such as that of jockey), followed before the bones have grown and hardened properly. The condition sometimes results from fracture of the lower end of the femur and malunion of the bone. In young children treatment of the constitutional disease will usually effect a cure; in older patients an operation may be needed. The deformity is the opposite to that known as knock-knee (*Genu valgum*) (q.v.).

Bow Street, between Long Acre and Russell Street, London, W.C., famous for its police court, which is the chief police court of the metropolis. The first of the B. S. magistrates was Sir Thomas de Veil, who, when an acting justice, lived in B. S. (1735), and the court really owes its subsequent estab. in B. S. to him. Fielding, the great novelist, was the next holder of the post. Until 1829 the work of the

B. S. magistrates embraced executive functions which are now performed by the commissioner of the Metropolitan Police. Extradition warrants under the Foreign Jurisdiction Acts are issued at B. S. police court. The street also gave its name to the B. S. runners, who served writs and acted as detectives up to the year 1829.

Bow Window, see BAY WINDOW.

Bowden, suburb of Adelaide (q.v.), S. Australia. Pop. 5000.

Bowdich, Thomas Edward (1791-1824), traveller in Africa and scientific writer, b. Bristol. He conducted a mission to Ashanti in 1815, and on his return pub. *A Mission from Cape Coast Castle to Ashanti*, 1819, and the *African Committee* in the same year. He then studied mathematics and natural science in Paris for a time, and in 1822 set out on a second expedition, but d. of fever at Bathurst, Gambia. He wrote sev. works, including *Discoveries of the Portuguese in Angola and Mozambique*, 1824; he also made a trans. of Moillon's *Découverte des sources du Sénégal et de la Gambie*, 1820.

Bowditch, Nathaniel (1773-1838), Amer. mathematician and astronomer, b. Salem, Massachusetts. From early youth he showed a bent for mathematics, but was bred to his father's business as a cooper, and later apprenticed to a ship-chandler. Between 1795 and 1803 he went on 5 long voyages to perfect himself in practical navigation. The trans. of Laplace's *Mécanique céleste*, 1829-38, with annotations, is one of his chief works. To this (fourth ed.) his son's life is prefixed, 1839, elaborated into a separate biography by another son, 1865. B. also wrote *The Practical Navigator*, 1802.

Bowler, Thomas (1754-1825), editor, b. Ashley, Bath. He studied medicine at St. Andrews and Edinburgh. In 1818 he pub. the *Family Shakespeare*, in 10 vols., in which 'those words and expressions are omitted which cannot with propriety be read aloud in a family.' He also ed. Gibbon's *History of the Decline and Fall of the Roman Empire*, 'with the careful omissions of all passages of an irreligious or immoral tendency.' His prudery was much ridiculed, and gave rise to the word 'bowdlerism.'

Bowdoin, James (1726-90), Amer. statesman, graduated at Harvard in 1745. During his governorship of Massachusetts (1785-6) he suppressed the insurrection known as Shays's Rebellion. In a letter to Benjamin Franklin he suggested that the phosphorescence of the sea was due to animalcules. It was in recognition of his scientific research that Bowdoin College, Brunswick, Maine, was named after him.

Bowdoin College, for the higher education of men, founded at Brunswick, Maine, in 1794, in honour of James Bowdoin (q.v.). Bowdoin's son gave large grants of land, money, etc., to B. C., which had a faculty of 76 members in 1955 for a student body of 783. It had 21 buildings, including a library of 234,000 vols., and a Union building.

Bowel, one of the divs. of the alimentary

canal below the stomach. It consists of the small intestine, which is divided into the duodenum, jejunum, and ileum, and the large, which is divided into the caecum, ascending colon, transverse colon, descending colon, sigmoid colon, and rectum. See also *INTESTINES*.

Bowell, Sir Mackenzie (1823-1917), Canadian politician, son of a carpenter, b. Rickingham, Suffolk, 27 Dec. His parents emigrated in 1833 to Belleville, Canada; here he became a journalist and newspaper proprietor. In 1867 he entered the Canadian Parliament as member for N. Hastings; after holding this seat for 25 years he passed to the Senate. As a Conservative and leader of the Orangemen he took a prominent part in politics, being successively minister of customs, militia, and commerce, and from Dec. 1894 to April 1896 Premier. His party being defeated on the education question, he led the opposition from 1896 to 1906. In 1895 he was made K.C.M.G.

Bowen, Charles Syngue Christopher, Lord (1835-94), lawyer and judge, b. in Glos. A great classical scholar, he became fellow of Balliol, 1858, and was called to the Bar at Lincoln's Inn, 1861. He appeared in the famous Tichborne case, 1872. He was raised to the Court of Appeal, 1882; became lord of appeal in ordinary, 1893. His last public service was presiding over the commission for inquiring into the Featherstone riots.

Bowen, Edward Ernest (1836-1901), schoolmaster, b. Woolston, near Chesham. Son of a curate, he was educ. at London and Cambridge, where he became a Fellow of Trinity. In 1859 he became a master at Harrow, and remained there for the rest of his life, becoming head of the modern side in 1869. In 1872 he wrote the Harrow school song, 'Forty Years On.' His *Harrow Songs and Other Verses* appeared in 1886.

Bowen, Elizabeth Dorothea Cole (1899-), novelist, b. Dublin. Taken to England as a child, she was educ. at Downe House in Kent. In 1923 she married Alan C. Cameron, and later they lived at Oxford. Her first book was *Encounters*, 1923, a vol. of short stories; other collections are *Ann Lee's*, 1928, *Joining Charles*, 1929, *The Cat Jumps*, 1934, and *Demon Lover*, 1946. Her first novel, *The Hotel*, 1927, was written at Bordighera; others are *Friends and Relations*, 1931, *To the North*, 1932, *The House in Paris*, 1935, *The Death of the Heart*, 1938, *The Heat of the Day*, 1949, *The Shelbourne Hotel*, 1951, and *A World of Love*, 1955. She also wrote a study of Anthony Trollope, 1946, and a book of essays, *Collected Impressions*, 1950. In 1948 she was made a C.B.E. and in 1949 received an honorary doctorate of Trinity College, Dublin.

Bowen, Sir George Ferguson (1821-99), administrator and colonial governor, b. Ireland, and educ. at Charterhouse and Oxford. Between 1859 and 1887 he was successively governor of Queensland, New Zealand (where he put an end to the Maori war), Victoria, Mauritius, and Hong Kong. He was knighted in 1886.

Bowen, Richard (1761-97), naval officer,

b. Ilfracombe. In 1794 he received his appointment as commander, and in the same year became captain of the *Terpsichore*, 32-gun frigate, which he commanded till his death. After naval operations in the W. Indies he returned to Europe, and in Oct. 1796, off Cartagena, captured the Sp. frigate *Mahonesa*. The *Terpsichore* was greatly damaged, but by Dec. she was off Cadiz, where she encountered the Fr. 36-gun frigate *Vestale*. His eventful career ended during Nelson's unlucky attack on Santa Cruz, July 1797, when B. was shot dead.

Bower, Archibald (1686-1766), Scottish eccles. historian, educ. at Douai and Rome. He joined the Society of Jesus, 1706, and was a member of the court of the Inquisition in Macerata, 1723-6. He ed. *Universal History*, 1735-41, and wrote *History of the Popes*, 1748-66.

Bower, or Bowmaker, Walter (1385-1449), Scottish chronicler, 'continuator of Fordun,' abbot of the monastery of St. Columba, in the is. of Inchcolm, Firth of Forth. When John of Fordun d., he had written his *Scotichronicon* to the death of David I. 1153, in 5 books. B. added 11 books, continuing the hist. to the death of James I. 1437. Walter Goodall pub. an ed. in Edinburgh in 1759.

Bower Bird, or Satin Bird, name given to certain birds of the Australian family Ptilorhynchidae, the best-known species of which are *Ptilorhynchus violaceus*, the satin, and *Chlamydera maculata*, the spotted B. B. The B. B. is also found in New Guinea, e.g. the species *Amblyornis inornata*. The name derives from the fact that it habitually builds bowers or 'runs' as well as nests.

Bowerbank, James Scott (1797-1877), geologist, b. London. Succeeded with a brother to his father's distillery. A distinguished microscopist, he formed a large collection of fossils. He founded with others 'The London Clay Club,' 1836; pub. *History of the Fossil Fruits of London Clay*, 1840. Became F.R.S., 1842; part founder of Palaeontographical Society, 1847. Wrote *A Monograph of the British Spongiadae* (Ray Society, 1864-82). The Brit. Museum bought his fine collection, 1864.

Bowfin, see MUDFISH.

Bowie-knife. Amer. hunting-knife, called after Col. James Bowie (c. 1790-1836), who in a skirmish near Natchez, 1827, killed an opponent with a blacksmith's file; this file he afterwards fashioned into a double-edged blade, about a foot long and more than an inch wide.

Bowles, Samuel (1826-78), Amer. journalist, b. Springfield, Massachusetts, son of Samuel B., who estab. the weekly *Springfield Republican*. B. junior devoted most of his life to the daily *Republican*, and by his ability gave it a national reputation. B. also wrote books of travel. *The Life and Times of Samuel Bowles* (2 vols., 1885) by Merriam is practically a hist. of Amer. politics after the compromise of 1850.

Bowles, William Lisle (1762-1850), poet, b. King's Sutton, Northants. Educ.

Winchester School and Trinity College, Oxford, he became rector of Bremhill, Wilts, and prebendary of Salisbury Cathedral. In 1789 he pub. *Fourteen Sonnets on Picturesque Spots*, which had a considerable influence on the then youthful Lake Poets. His longer poems, *The Spirit of Discovery*, 1804, *The Missionary of the Andes*, 1815, *The Grave of the Last Saxon*, 1822, have not the merit of his sonnets. In 1807 he pub. his ed. of Pope's works, with a memoir and critical notes, which gave rise to the famous 'Pope and Bowles' controversy. See Gilfillan's ed. of his works, with memoir, 1855, and G. Greover, *A Wiltshire Parson and his Friends*, 1926.

Bowling, indoor game played in an alley with wooden balls and 10 wooden pins. Though played in Germany and the Low Countries since the 14th cent., it attained its greatest popularity in the U.S.A., being introduced thither by the Dutch emigrants. Up to 1840 the Dutch pop. of New York played the game on the green, and the bowlers' square N. of the Battery is still called B. Green. The first covered alleys were of hardened clay or slate, but they are now of alternate pine and maple strips of a width of about 1½ ft., set on edge and fastened together and to the bed of the alley. The alley itself is 41½ in. wide and 80 ft. long, while on each side is a 9-in. gutter to catch 'wides,' and at the back a heavily padded wall. It is played with 10 pins or 'skittles' (the tenth having been added to evade the law against the game of 9 pins), which are set up in the form of a triangle. The balls may be any size not exceeding 27 in. in circumference and 16 lb. in weight. There is no limit to the number of players, though 5 is the usual number for championship teams. The object of the game is to knock the pins down, each player rolling 3 balls (a frame), 10 frames making a game, though in first-class matches only 2 balls are bowled. If all 3 balls are used, the number of pins overturned is recorded. Where 2 only are used a seemingly complicated mode of scoring by strikes and spares is adopted. There are thousands of B. clubs in the U.S.A. and Canada, nearly all under the jurisdiction of the Amer. B. Congress. Variations of the game are cocked hat, quintet, four buck, duck pin, head pin, etc., the variation being in the size or disposition of the pins, the size of the balls, the number of pins, or the mode of scoring. For the Eng. form of the game see SKITTLES.

Bowling Green: 1. Co. seat of Warren co., Kentucky, U.S.A., on the Barren R., and on the Louisville and Nashville railroad. It contains many educational institutions, including W. Kentucky State Teachers' College and B. G. College of Commerce. It was incorporated in 1812, and received a charter in 1893. There is considerable trade in agric. produce, and also in horses and cattle. It manufs. evaporated milk, packed meat, beverages, foundry, building material, and concrete products, electric tubes, and clothing; there are also flour and feed mills, saw mills, and oil and rock-asphalt processing

plants. During the Civil war it was an important strategic point. Pop. 18,347.

2. City of Ohio, U.S.A., 19 m. from Toledo in an agric. dist. Products include machine tools, machinery, vehicles, and cut glass. It is the seat of B. G. State Univ. Pop. 12,000.

Bowls, oldest of Brit. outdoor pastimes next to archery, dating back, at least in its rudimentary forms, to the 13th cent. (contemporary MSS. contain drawings that sometimes represent players bowling at a jack (e.g. a MS. in the Windsor Royal Library, No. 20 E. iv) and sometimes as bowling at no apparent mark at all (e.g. a 14th-cent MS. book of prayers in the House collection at the Bodleian Library, Oxford). The game grew so popular that it threatened to jeopardise the practice of archery, with the result that statutes forbidding it, together with other sports, were passed in the reigns of Edward III, Richard II, and other monarchs. When the bow had fallen into desuetude as a weapon of war, bowling continued to be the subject of repressive legislation on account of its all-too-frequent connection with taverns, which caused them to be much patronised by gamblers and the dissolute generally. The word *B.* occurs first in the Act of 1511, which confirmed previous enactments against unlawful games. Landowners under a later Act could obtain licences to play on their own private greens, but throughout the Tudor period the game continued to be the subject of legislative interference, and in Elizabeth's reign the scandals of the bowling alleys grew notorious. But the game still waxed in popular favour, and, if Shakespeare is to be credited, women played it in his time (*Richard II*, Act III, Sc. iv). By this time biased *B.* had been introduced, and doubtless pictures that represent Sir Francis Drake on Plymouth Hoe are accurate in portraying that historic match as being played with such *B.* In 1618 the game had grown high in royal favour, and James I and his sons Prince Henry and Charles I of England were all enthusiastic bowlers. Evelyn and Pepys both record the fact that notable persons played the game for stakes; and indeed it was only after the revolution of 1688 that it degenerated once more into a pot-house recreation. Its revival is due to its popularity in Scotland, in which country it became popular in the 19th cent. although known at a much earlier date. The celebrated Southampton Bowling Club was founded as long ago as 1299. Many others, like the greens in Candleriggs and Gallowgate, date back to the early part of the 18th cent. It was not, however, until meetings were held in Glasgow to promote a national association that the game really became organised and a national code of rules adopted, and the first regular bowling club of which there exists any trace is the Willowbank Club, founded in Glasgow at the commencement of last cent. Another notable step in Scotland was the use of seaside turf for seed-grown or meadow turf. Further, Scottish emigrants introduced the game wherever they

went, notably in the colonies. *B.* is played on the continent of Europe, though hardly on scientific principles. There is also some warrant for supposing that the Dutch played it in the 17th cent. In the last quarter of the 19th cent., when the Scottish influence seemed to be waning, Australia led the way in organisation by the estab. in 1880 of the Bowling Association of Victoria and New S. Wales. In 1892 the Scottish Bowling Association was founded, and then between 1895 and 1904 the Midland Cos., the London and S. Cos., the Imperial, the Eng., and the Irish and Welsh bodies were formed, and though this multiplicity of associations tended at first to prejudice homogeneity in organisation, yet their very formation indicates the fact of the tremendous popularity of the game. It has now become quite a local feature of tns. In Scotland the public greens are self-supporting from a charge including the use of *B.* for a few pence an hour per player. In London the upkeep of the greens falls on the rates, and players have to provide their own *B.* There are 2 kinds of bowling-greens, the level and the crown. The former is the usual kind, the latter being confined almost entirely to the N. and Midland cos. The crown has a fall which may be as much as 18 in. all round from the middle to the sides and affords but limited scope for skill and scientific play. The level must be of a minimum size of 33 yds by 21 yds, but an ideal green is 42 yds square. The orthodox direction is up and down. The whole ground is excavated to a depth of from 1 to 2 ft, drained, and the turf laid over layers of gravel, clinders, mould, and silver sand. Round the entire green is a ditch 4 to 6 in. deep and having a holding surface not injurious to *B.*; beyond the ditch is a bank of turf. The green is divided into spaces not less than 19 to 21 ft in width styled 'rinks,' which word also designates each set of 4 players, and these rinks are numbered on a plate fixed in the bank at each end. Every player usually uses 4 lignum vitae *B.* in single-handed and pairs games, 3 in triples games, 2 in rink games. The bias is obtained by making one side more convex than the other, the bulge showing the side of the bias. No bowl must have less than No. 3 bias, i.e. it should draw about 6 ft to a 30-yd jack. The diameter of the bowl should not be less than $4\frac{1}{2}$ in. or more than $5\frac{1}{2}$ in., while its weight should not exceed $3\frac{1}{2}$ lb. The jack is a white earthenware ball $2\frac{1}{2}$ in. in diameter. Theoretically the game is simple, the aim of the player being to deliver his bowl so as to cause it to rest nearer to the jack than his opponent's, or to protect a well-placed bowl or to dislodge a bowl in a better position than his own. In practice, however, there is great opportunity for skill. The teams comprise 5 rinks of players in International matches; 6 rinks of 4 players in Inter-County matches; and 3, 4, 5, or 6 rinks of players in club matches. The leader of each rink is chosen for his skill in playing to the jack. The ideal position for the leader is a bowl

at rest in front of or behind the jack, but not obstructing the path of subsequent B. As a rule a 'singles' match consists of 21 points; pairs and rink matches of 21 ends; and triples matches of 18 ends. See H. P. Webber and J. W. Fisher, *Bowls*, 1948; R. T. Harrison, *How to become a Champion at Bowls*, 1952; J. P. Munro, *Bowls Encyclopaedia*, 1952; J. Jones, *Bowls from every Angle*, 1954; A. T. Evans, *Competitive Bowls*, 1956.

Bowmaker, Walter, see BOWER, WALTER.

Bowman, Isaiah (1878-1950), Amer. geographer, educ. at the State normal college, Ypsilanti, Michigan, and at Harvard and Yale. Was assistant in physiography at Harvard, 1904-5, and, later, instructor in geography at Yale and prof. of geography at Yale, 1909-15. Director of the Amer. Geographical Society. Went with the geographical and geological Yale Peruvian expedition in 1911, and was leader of the expedition to the central Andes under the auspices of the Amer. Geographical Society in 1913. He was a member of various territorial commissions of the Peace Conference at Paris in 1919. Among his numerous pub. works are *Forest Physiography*, 1911, *South America*, 1915, *The Andes of Southern Peru*, 1916, *The New World—Problems in Political Geography*, 1921, *Desert Trails of Atacama*, 1923, and *Design for Scholarship*, 1936.

Bowman, Sir William (1816-92), ophthalmologist, b. Nantwich. He was prof. of physiology at King's College, London, 1845-55; Fellow of the Royal Society, 1841; and of the Royal College of Surgeons, 1844; the first president of the Ophthalmological Society, 1880-3. He won a great reputation by his *Lectures on Operations on the Eye*, 1849. He was also surgeon to the Royal London Ophthalmic Hospital and to King's College Hospital. He was created baronet in 1884. He pub., in conjunction with Todd, *The Anatomy and Physiology of Man*, 1843-56, and his *Collected Papers* were ed. by Sanderson and Hille, with a life by H. Power, 1892.

Bowness, tn on the E. shore of Lake Windermere, Westmorland, England, 8 m. NW. of Kendal, part of Windermere (q.v.) urban dist.

Bowood, seat of the Marquess of Lansdowne. It is 2 m. from Calne, Wilts, and is noted for its gardens.

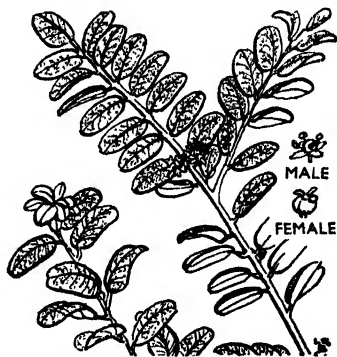
Bowra, Sir Cecil Maurice (1898-), scholar. He was educ. at Cheltenham and New College, Oxford. During the First World War he served in France with the artillery. After it he became a Fellow of Wadham College, and in 1938 was elected Warden. In 1946 he was appointed Prof. of Poetry and in 1951 became Vice-Chancellor of Oxford and was knighted. An accomplished classical scholar, he has also a wide knowledge of many literatures. Among his works are *Tradition and Design in the Iliad*, 1935, *Greek Lyric Poetry*, 1936, *Early Greek Elegists*, 1938, *The Heritage of Symbolism*, 1943, *A Book of Russian Verse*, 1943, *Sophoclean Tragedy*, 1943, *From Vergil to Milton*, 1945, *The Romantic Imagination*,

1950, *Heroic Poetry*, 1952, *Problems in Greek Poetry*, 1953, and *Inspiration and Poetry*, 1955.

Bowring, Sir John (1792-1872), statesman, traveller, and linguist, b. Exeter. He began his working life in a merchant's office, but devoted much of his time to languages, for which he had a remarkable talent. He became the first editor of the *Westminster Review*, 1824, and trans. much foreign poetry, both ancient and modern, into English. He was a member of Parliament 1835-7 and 1841-9, and an active free-trader, and became governor of Hong Kong in 1854. In 1856, the *Arrow*, bearing the Brit. flag, was fired upon, and B., to avenge the insult, bombarded Canton without consulting the home gov. His action was severely criticised, and a vote of censure was moved against him in Parliament.

Bowsprit, boom or spar projecting from the bows of a sailing ship and cut of a steamer, when its stem is of the cut-water type. It supports the jib-boom. An elongation of the spar is used to fix the foremost stay-ropes, which carry the sails.

Bowyer, William (1699-1777), Eng. printer; educ. at St John's College, Cambridge. In 1722 he became his father's partner in business, and his firm was chosen printers of Votes of House of Commons in 1729, and Journal of House of Lords in 1767. His most important work was *Conjectural Emendations of the Greek Testament*, 1763, and he also wrote 2 essays upon the *Origin of Printing*, which were pub. in 1774. He trans. Rousseau's first *Discourse* in 1751.



Box (*Buxus*), genus of 30 evergreen shrubs of the family Buxaceae. The common B. (*B. sempervirens*) is widely distributed, and found in hilly, chalky dists. The wood is of commercial value, used in wood-engraving, and in the manuf. of musical and mathematical instruments. See TIMBER.

Box, genus of the family Sparidae (sea-breams), is characterized by the species possessing trenchant teeth. They are

carnivorous, often brightly coloured fishes, inhabiting tropical and temperate seas, and are usually edible. *B. salpa* has a bluish body with yellow stripes.

Box Day, in Scots law, was formerly one of the days during vacation appointed by the Court of Session for lodgment of papers required to be deposited in court. It was so named from the boxes in which the documents were placed. The procedure was abolished in 1933.

Box Elder, see ACER.

Box-hauling (navigation), a manoeuvre practised when a sailing-ship close hauled refuses to tack and there is not room to wear. The head-sails are thrown aback to give her stern-way, the helm then put alee, and she falls off, after which she is rounded to, and her proper course resumed.

Box Hill, beauty spot in Surrey, England, being a spur of the N. Downs, 590 ft high, about a mile from Dorking, and so named from the box-trees on it. It was given to the nation by Leopold Salomons and is now held by the National Trust.

Box-thorn (*Lycium*), genus of Solanaceae found in Europe and America, consisting of thorny shrubs and trees. *L. europaeum* grows in Europe. *L. chinense*, Chinese tea-tree, and *L. halimifolium* are hardy sea-side shrubs. *L. pallidum*, SW. U.S.A., is the best in bloom.

Boxall, Sir William (1800-79), painter, b. Oxford. He studied at the Royal Academy and in Italy. He exhibited his 'Jupiter and Latona' at the Academy in 1823. He specialised in portraits and also illustrated the Waverley Novels, was Director of the National Gallery, 1865-74, and knighted 1867.

Boxer, or **German Bulldog**, popular breed in Britain and the U.S.A. since being crossed with the Brit. bull-dog; an attractive companion and good guard. Colours are brindle, red, or fawn. It is muscular and compact, with broad head and short nose.

Boxers, **The**, name given by Europeans to the members of a Chinese secret society (I-ho T'u-an), partly religious, partly political, which was organised in 1896 by the prefect of Shantung. Its members were opposed to foreign influence, and their hostility was aggravated by demands of the W. powers for land and privileges in China. This, together with drought and famine and troubles at court, urged them on to terrible excesses. Murder of a missionary met with but slight punishment; hence they organised an anti-missionary rising, 1900, and determined to destroy all foreigners in their country. They marched through China pillaging, destroying railways, and murdering missionaries and Chinese Christians. The dowager empress gave support to the movement, the imperial troops making no attempt to crush the rising. At Peking the B. murdered the 1st secretary of the Jap. legation and the Ger. minister, Baron von Ketteler, and then besieged the legations. This intolerable behaviour gave rise to an intervention of all the European powers. Americans and Japanese also joined the allies for the purpose of

suppressing the B. Hard fighting took place at Tientsin and elsewhere, but finally the relief party succeeded in freeing the besieged, Aug. 1900. The court fled, and the allies were left in possession of Peking until a peace was signed in Sept. 1901.

Boxing is the method of fighting with the fists either with or without gloves, though the latter method is not in vogue to-day, but at one time it was very common, and perhaps should really come under the heading of pugilism. In ancient times B. was practised at the Gk and Rom. gladiatorial spectacles. Among both the Greeks and Romans, however, the naked fist was not used, but a kind of glove known as the cestus (q.v.), made of leather and sometimes loaded with iron or lead. It was a terrible weapon, and these fights frequently proved fatal. Later a mixture of B. and wrestling, called Pankration, became popular. The rules were revised after sev. contestants had been killed. It is in England, however, that the 'noble art,' as it is sometimes called, attained a high state of proficiency. It first came into public notice in this country in the early part of the 18th cent. James Figg opened the first B. booth in London in 1719, and it continued to increase in popularity all through the reigns of the 4 Georges. Jack Broughton was the first man to think of using gloves for B. They were known as muffers, and the same boxer also drew up the first set of rules. After Broughton's death the public interest in the ring flagged a little, but a boxer named Tom Johnstone stepped into the breach. From 1750 up to about 1820 the interest in the ring was enormous. All classes of society, high and low, took a part. Byron has related in his diary how he had lessons in B. from the famous 'Gentleman' Jackson, who made a fortune out of pugilism. Mendoza the Jew, Jem Belcher, Humphreys, Tom Cribb, Spring, and Dutch Sam were all famous fighters of their day. Gully was a pugilist who afterwards entered Parliament, and more extraordinary still was the case of Bendigo, who became a revivalist preacher, and of whom the story is told that he once used threats of a pugilistic nature to induce his congregation to give liberally to the collection. Since about 1820 the ring has been shorn of much of its glory, and the days of the 'Corinthians,' the rich patrons of the ring, are now over. From 1850 to 1860 public interest was re-aroused by the B. of such men as Sayers and Heenan, Broome and Mullins, but other sports have since grown in the public favour. Public interest has always tended to centre on the heavyweights, and among the more notable boxers who have held the world championship of this div. since the latter part of the 19th cent. are John L. Sullivan, James J. Corbett (q.v.), Bob Fitzsimmons (q.v.), James J. Jeffries, Tommy Burns, Jack Johnson, Jess Willard, Jack Dempsey, 'Gene' Tunney, Joe Louis, and 'Rocky' Marciano.

Professional boxing in Britain is under the sole control and jurisdiction of the Brit. Boxing Board of Control (B.B.B. of C.), formed in 1929, and all contests are

conducted under the rules laid down by this body. The board consists of 21 stewards, who are unpaid and have no financial interest in the sport. Their theoretical function resembles in a general way that of the stewards of the Jockey Club (see HORSE-RACING). They are divided into 2 groups which deal respectively with administration (e.g. policy making) and disciplinary action (stewards of appeal). Although the B.B.B. of C. has no legal standing, it is regarded by the gov. as the responsible body. Before a foreign boxer can take part in a contest in Britain application must be made to and permission obtained from the Minister of Labour by the board, which is held responsible for the assessment and collection of his income tax. In the U.S.A. control is in the hands of state-appointed B. commissions and associations whose rules are the law of the state. Everyone having a financial interest in professional B.—boxers, managers, trainers, seconds, promoters, referees, etc.—is required to hold a B.B.B. of C. licence, for which an ann. fee is payable to the board, which also receives a percentage of the takings from all promotions. In the case of referees the applicant must be interviewed and approved and must then pass oral and practical examinations before a licence is granted. For administrative purposes the B.B.B. of C. divides Britain into 8 areas—Scotland, Wales, N. Ireland, and 5 areas in England. Each area has its own council consisting of 19 members, elected to represent the interests of all parties. Each area also has its own medical officer.

The recognised weight categories of professional B. throughout the world are:

Flyweight	8 st. and under
Bantamweight	8 st. 6 lb. and under
Featherweight	9 st. and under
Lightweight	9 st. 9 lb. and under
Welterweight	10 st. 7 lb. and under
Middleweight	11 st. 6 lb. and under
Light-heavyweight	12 st. 7 lb. and under
Heavyweight	Any weight

Each contest must be for a specified number of rounds. No contest shall exceed 15 rounds nor be of less than 12 min. duration, except in the case of novice competitions where contests may be of 8 min. duration. There is now no question of contests being fought to a finish as in the days of the prize ring. Rounds must be of 3 min. duration with 1 min. intervals. In novice contests 2-min. rounds are permitted. The terms 'fight' and 'knock out' are never used officially and have been replaced by 'contests' and 'count out.' All contests are to be decided in a 3-roped ring (with the ropes joined in the centre of each side) not less than 14 ft or more than 20 ft square, and not less than 18 in. margin of ring floor outside the ropes. The floor is to be covered with canvas over a layer of felt. Corner posts are to be padded. Boxers must shake hands before the commencement of the contest and before the beginning of the last round. Contestants must be stripped to the waist, use

dark coloured shorts, and box in regulation boots without heels or spikes. The gloves are to weigh 6 oz. each and contestants to weigh in on the day of the contest. Breaking by twisting, and removal of the padding by fingering or thumbing from the potential part of the glove is prohibited. If bandages are used, the length of bandage in each hand must not exceed the following: flyweight to middleweight, 9 ft; light-heavyweight and heavyweight, 12 ft; width must not exceed 1 in., and material must be the best adhesive tape; 9 ft. of 2-in. soft bandage (W.C.W., B.P.C.), as supplied by the board for championships, may also be used, except in the light-heavyweight and heavyweight divs. when 12 ft of tape and 12 ft of bandage are allowed. In all contests a referee, who must officiate inside the ring, and a timekeeper shall be appointed by the board. In contests of 6 rounds or under, 2 seconds for each boxer shall be allowed in the ring; in other contests 4 seconds are allowed for each boxer. The seconds shall leave the ring when ordered to do so by the timekeeper: the referee shall see that this is carried out. The seconds shall give no advice or assistance to the contestants during the progress of any round. Contestants must be medically examined immediately after the weigh-in on the date of the contests. The referee shall award a maximum number of 5 marks at the end of each round to the better man and a proportionate number to the other contestant or, when equal, the maximum number to each. Marks are awarded for 'attack'—direct clean hits with the knuckle part of either glove on any part of the front or sides of the head or body above the belt (the belt is an imaginary line drawn across the body from the top of the hip bones), and for 'defence'—guarding, slipping, ducking, or getting away. Where contestants are otherwise equal, the majority of the marks shall be given to the one who does most of the leading off or who displays the better style. If a contestant is down, he must get up unassisted within 10 sec: his opponent meanwhile must retire to the farthest neutral corner and shall not resume B. until ordered to do so by the referee. A man is considered down even when he is on one or both feet, if at the same time any other part of his body is touching the ground, or when he is in the act of rising. A contestant failing to continue the contest at the expiration of 10 sec. shall not be awarded any marks for that round, and the contest shall then terminate. If at the conclusion of any round during the contest, one of the contestants should attain such a lead on points as to render it an impossibility for his opponent to win, he must then be declared the winner. The referee shall decide each contest in favour of the contestant who obtains the greater number of marks. The referee shall have the power to disqualify a contestant for any of the following acts: hitting below the belt, using the pivot blow, hitting on the back of the head or neck or on the kidneys, hitting with the open glove, or the inside

or butt of the hand, the wrist, or elbow, for holding, butting, shouldering, wrestling or roughing, for ducking below the waistline, intentionally falling without receiving a blow or for any other act or conduct which he may deem foul. A contestant disqualified for any cause whatever shall not be entitled to any prize or remuneration, except in accordance with regulation 20, paragraph 16, of the B.B.B. of C. The referee, who has the power to stop the contest if in his opinion a contestant is outclassed or accidentally disabled, shall decide any question not provided for in the rules and the interpretation of any of these rules on matters arising during the time the contestants are in the ring. The referee's decision is final. See G. E. Odd, *Ring Battles of the Century*, 1949; T. Leigh-Lyde, *The Squared Circle: from Corbett to Ezzard Charles*, 1951; F. Mills, *Learn to box with me*, 1955.

Amateur boxing. In Great Britain amateur B. comes under the control of sev. associations. The Amateur Boxing Association (A.B.A.) is the governing body in England, the Scottish A.B.A. in Scotland, and the Welsh A.B.A. in Wales. Amateur B. in Eire and N. Ireland comes under the jurisdiction of the Irish A.B.A. Wales was affiliated to the A.B.A. until Dec. 1955, and Scotland also came within the A.B.A. until about 1946. To-day each of these bodies is separately affiliated to the International Association. However, a joint consultative committee still enables the 3 associations to meet for the discussion of matters of mutual interest.

The A.B.A., formed in 1880, is the oldest such organisation in the world, and the original rules of most other associations and federations, including those of the world controlling body, Association Internationale de Boxe Amateur (A.I.B.A.), have been based on those of the A.B.A. Evolution necessitates changes, and these original rules, whilst retaining their basic qualities, have been amended from time to time, to allow of such innovations as the referee-in-the-ring, the audible count, etc. Tradition dies hard, however, and the A.B.A., parent of amateur B., has often been amongst the last to adopt such changes. With H.Q. in London, the A.B.A. governs amateur B. in all affiliated clubs in England, including all units of the services, pre-services organisations, and all clubs within the National Association of Boys' Clubs (see *BOYS' CLUBS*). There are a number of B. clubs throughout the country which have chosen to affiliate to the A.B.A., but their numbers are relatively few. It should be noted that a club does not become affiliated automatically on application. Certain minimum standards as to training facilities, equipment, and instructors are necessary, and, of course, the rules of a club must be approved by the parent body. Fundamentally the regulations governing amateur B. and professional B. in Great Britain do not vary greatly. Important differences, however, are the following. Amateur B. contests are controlled by a referee (who does not score) and 3 judges seated at different sides of the ring (who

give the decision at the end of a bout, if the referee has not stopped it, because of injury, for example, and given his sole decision); the wearing of a singlet, as in all other amateur sports; a 'drawn' decision may not be given. The raising of the winner's hand, whilst possible under A.I.B.A. rules, is not generally followed in England, except occasionally in international matches. Apart from certain junior classes, the weight of gloves is 8 oz.; the ring may vary from 12 ft to 20 ft square. Whilst amateur and professional B. in Great Britain are administered by 2 completely separate bodies, representatives from each meet from time to time to discuss mutual interests, and a close and friendly liaison is maintained.

Until 1950 the weights of the amateur and professional organisations were the same, but to lessen the disparity in weight in the more popular categories, the A.I.B.A. increased the weight classes from 8 to 10. These metric weights, now adopted throughout the amateur world, and their airdupois equivalents used in Great Britain, are:

Flyweight	51 kg.
(8 st.: 112 lb.)	
Bantamweight	54 kg.
(8 st. 7 lb.: 119 lb.)	
Featherweight	57 kg.
(9 st.: 126 lb.)	
Lightweight	60 kg.
(9 st. 7 lb.: 133 lb.)	
Light Welterweight	63 5 kg.
(10 st.: 140 lb.)	
Welterweight	67 kg.
(10 st. 8 lb.: 148 lb.)	
Light Middleweight	71 kg.
(11 st. 2 lb.: 156 lb.)	
Middleweight	75 kg.
(11 st. 11 lb.: 163 lb.)	
Light Heavyweight	81 kg.
(12 st. 10 lb.: 178 lb.)	
Heavyweight	over 81 kg.
(Any weight)	

Affiliated clubs wishing to hold a tournament must obtain permission from the A.B.A. The A.B.A. appoints the main officials such as referees, judges, clerks of scales, and often timekeepers. The duration of rounds varies with the type of competition or contest, as does the duration of the bout on occasion. Schoolboy B., up to the age of 15, is left in the hands of the Schools A.B.A., which is affiliated to the A.B.A. Boxers over 15 are divided into 2 broad categories: Juniors, 15 to 17 years of age, and Seniors, over 17. Juniors for competition purposes have 2 classes: A (15-16 years), and B (16-17 years), and in addition are sub-divided as 'Junior Novices' and 'Juniors.' Senior boxers are in 3 classes: 'Novice,' 'Intermediate,' and 'Open.'

Whilst the A.B.A. controls amateur B. in England there are throughout the country, for administrative purposes, various subsidiary associations, e.g. the London A.B.A. prov., co., and service associations, all of which have representation on the A.B.A. council and many of its committees. Although all come under the 'umbrella' of the basic A.B.A.

regulations, they have autonomy in local affairs and can alter their rules to meet local conditions, subject to the A.B.A.'s permission. In recent years many of these subsidiary associations have instituted medical schemes, the forerunner being that of the London A.B.A. These schemes vary in minor respects throughout the country, but all have as their object the protection of the competitor from himself.

Though normally participating in a number of international matches each season, the A.B.A.'s main event of the year is the final stage of the A.B.A. championships, usually held on the last Friday in April at the Empire Pool and Sports Arena, Wembley. Prior to this eliminating championships are held, not only in England, but in Scotland and Wales, both of whom take part in the A.B.A. championships. All championship bouts are decided over three 3-min. rounds.

It is essential that all participants in amateur B., whether they be competitors or officials, comply with the A.B.A. definition of an amateur which is as follows: 'An amateur is one who has never competed for a money prize, staked bet, or declared wager, who has not competed with or against a professional (except with the express sanction of the A.B.A.), and who has never taught, pursued, or assisted in the practice of athletic exercise as a means of obtaining a livelihood or pecuniary gain, or accepted money directly or indirectly for acting in an official capacity therein or contracted to participate professionally therein.'

The A.B.A. have as patron H.R.H. the Duke of Edinburgh; his grace, the Duke of Hamilton (a former Scottish amateur champion), is vice-patron. In 1956 the 11th Hon. the Earl of Derby became the association's president, the first time in the list of the A.B.A. that the president has not come from within its own ranks.

Amongst the main functions of the International Association are the technical arrangements for the Olympic Games (q.v.) and the holding of the European championships. Unlike the former, which are held every 4 years, the latter are held every odd year (1957, 1959, *et seq.*), and are without doubt, the toughest proposition for competitors, outside the Olympic Games. Styles, of course, vary enormously, but style, important as it is, is a secondary factor in B. The first essential is to attack, and naturally to defend. Therein lies the strength of most of the continental experts of amateur B., allied to the supreme fitness, without which success in this arduous sport must prove an elusive will-o'-the-wisp. Apart from the Olympic Games, European championships, and certain other regional games, most nations find experience and competition through the medium of international matches. In this respect the A.B.A. has provided its boxers, not to mention the public (physically present and televiewing) with a universal cross-section of amateur B. teams ranging from the U.S.A. to the U.S.S.R.

See A. Newton, *Guide for Beginners: Learn how to Box*, 1945; R. E. Clarke, *Amateur Boxing*, 1949; J. T. Hankinson and R. G. B. Faulkner, *Boxing for Schools*, 1952.

Boxing Day, one of the Eng. bank holidays (26 Dec.). On B. D. the ann. presents or Christmas boxes were once given to employees, but it is now usually done on the last working day before the holiday. See **BANK HOLIDAYS**.

Boxmoor, see **HEMEL HEMPSTEAD**.
Boxtel, small tn in the prov. of N. Brabant, Netherlands, 8 m. S. of 's Hertogenbosch. At B. the French defeated the English and Dutch allies, 1794. Here Wellington, then Col. Wellesley, witnessed his first battle and distinguished himself in covering the retreat. B. is the centre of a textile industry.

Boy-bishop. In mediaeval times, on the feast of St Nicholas (held up as a model for imitation by boys), 6 Dec., a choir-boy in each cathedral was elected by his fellows to act as bishop till Innocents' Day, 28 Dec., and during this period a number of burlesque ceremonies took place, with the full approval of eccles. and royal authorities. These buffooneries ended in England at the Reformation, but the Eton 'Montem' (which used to be held in winter but was stopped in 1844) is said to have descended from them.

Boy Scouts, organisation for boys, founded in 1908 by Lt.-Gen. Lord Baden-Powell (q.v.), worldwide movement which, through its handbook *Scouting for Boys*, aims at training boys to be manly, self-reliant, and self-respecting. They learn to be quick and ready in action, and to co-operate one with another. The pledge taken is: 'I promise on my honour to do my duty to God and the Queen; to help other people at all times, and to obey the Scout law.' It is officially disclaimed that there is any military aim or meaning in scouting for boys. The purpose rather is to nurture good citizens and inculcate principles of international good-fellowship. The boys practise signalling, tracking, first aid, cooking, stalking, camping, and various other useful activities. The unit for work is the 'patrol,' a party of some 6 or 8 boys under a boy leader. Any number of patrols may form a troop, under a scoutmaster and his assistants. Boys whose interest is in nautical affairs are enabled to join the Sea Scouts, and a corresponding body of Air Scouts was formed in 1941. Boys are divided by age into 4 training sections: Wolf Cubs, for those of 8-11



THE BADGE OF THE
BOY SCOUTS IN
GREAT BRITAIN

The fleur-de-lis is incorporated in varying devices in the badges of Boy Scouts in other countries.

years; Scouts, from 11 to 15; Senior Scouts from 15 to 18; and Rovers from 17 to 24. The organisation of B. S. is based on decentralisation of authority and responsibility. Funds are raised locally. The standard uniform of the B. S. is chiefly of khaki colour, with various colours for the different troops and patrols (neckerchief and shoulder knots). Considerable variations in uniform are permitted, however, in the following of traditional national dress.

In 1911 there was a royal rally of B. S. in Windsor Park, and the following year a royal charter of incorporation was granted. During the First World War B. S., and especially Sea Scouts, found opportunities for service, and in 1920 peace was celebrated by an international jamboree, held at Olympia, London. The boys of 27 countries were represented, testifying to the growth of the movement. In Aug. 1929 the movement celebrated the 21st anniversary of the pub. of *Scouting for Boys*, and 50,000 B. S. met together at Arrow Park, Birkenhead, representing 42 nationalities differing in language, creed, and colour. There have been 9 world Scout jamborees; the eighth was held at Niagara-on-the-Lake, Canada, in 1955, the first time that a jamboree had been held outside Europe. A thousand B. S. went by air from Great Britain. The ninth world jamboree, the Jubilee Jamboree, was held at Sutton Coldfield, Warwick, England, 1-12 Aug. 1957. This was the greatest representative international gathering ever held, and some 35,000 scouts from 85 countries attended. The jamboree celebrated the golden jubilee of the Boy Scout movement and the centenary of the birth of its founder, Lord Baden-Powell of Gilwell.

During the Second World War the B. S., including the Sea Scouts and Air Scouts, distinguished themselves by useful service in home defence and in a number of other ways. Lord Rowallan (q.v.) became Chief Scout in Feb. 1945. The total active membership in the U.K. is over 532,380 (1956), and in the rest of the Brit. Commonwealth about 1,041,000. The movement was introduced into the U.S.A. in 1910, and has grown rapidly, membership now numbering nearly 4,000,000. The aggregate world membership is about 7,000,000 in over 100 countries.

See Lord Baden-Powell, *Scouting for Boys*, 1908, *Wolf Cubs' Handbook*, 1916, *Aids to Scoutmastership*, 1920, and *Rovering to Success*, 1922; E. E. Reynolds, *Baden-Powell*, 1942, and *The Scout Movement*, 1950.

Boyacá: 1. Dept in central and E. Colombia; cap. Tunja. Rich mineral resources are to be found, and dense forests on the mt slopes yield fine timber. It was the centre of liberating forces in the struggle for independence. Area 24,934 sq. m.; pop. 791,300.

2. Vil. of above dept, where Bolívar and Santander defeated the Spaniards in a decisive victory in 1819. Pop. 370.

Boyers, higher nobility in Russia till Peter the Great's time; they took part in the Prince's (later Tsar's) Council

('Boyars' Duma') and headed the military and civil administration.

Boyce, Hector, see BOECE, HECTOR.

Boyce, William (c. 1710-79), Eng. organist and composer, educ. at St Paul's School in London, being a chorister in the cathedral, and later an apprentice to Dr Maurice Greene. In 1734 he became organist at Oxford Chapel (St Peter's), Vere Street, and in 1736 at St Michael's, Cornhill, becoming in the same year composer to the Chapel Royal. In 1737 he was appointed conductor of the Three Choirs Festival, and in 1749 became organist at All Hallows, Thames Street; succeeded Greene as master of the king's band in 1755, and in 1758 became organist to the Chapel Royal. His works include much music for stage entertainments, a large number of services and anthems, secular choral works, 8 symphonies, and other instrumental music; but he is best known for his ed. of *Cathedral Music*, 1760-78.

Boycott, Charles Cunningham (1832-1897), Eng. land agent, educ. at Blackheath and Woolwich. In 1850 he entered the army; retired some years later as captain; 1873, agent for Lord Erne's estates in co. Mayo, coming into conflict, 1879, with the Land League agitators. They, under Parnell (q.v.), began to persecute B., 1880; men refused to work for him, and he had to be placed under police protection. Hence the modern phrase 'to boycott a person' is derived. B. left Ireland for London and the U.S.A., but, returning in the autumn of 1881, was again mobbed and ill-treated. After this conditions gradually improved; 1886, he became agent of Adair's estates in Suffolk; 1888, he gave evidence before the commission appointed to examine charges made by *The Times* against the Irish leaders. See Barry O'Brien's *Parnell*, i.; *The Times*, 22-4 June 1897; *Correspondence of Lord Erne and Loughmask Tenantry*, 1880. See **BOYCOTTING**.

Boycotting, form of coercion consisting in a conspiracy to prevent all dealings, social, commercial, or otherwise, with the person aimed at. First used against Capt. C. C. Boycott (q.v.) in 1880. This form of persecution was stringently dealt with under the Crimes Act of 1887, but is not yet extinct in Ireland. B. became more and more a form of international warfare. In 1912 the Turks declared a national boycott against everything Italian. In 1910 all Gk goods were rigorously boycotted. The *Shwadeshi* (or *Swadeshi*) movement in Bengal, India, was the boycott of Brit.-made wares as a protest against the partition of that prov. Amer. trade unions adopted this method of treating employers with whom they quarrelled. Boycotts in the form of denial of supplies of goods have also been used in Britain, America, and elsewhere as a means of enforcing conditions of trading, e.g. resale price maintenance (q.v.).

Boyd, Andrew Kennedy Hutchinson (1825-99), minister and author, widely known as A.K.H.B., b. Auchinleck, Ayrshire; educ. at King's College, London,

and the Middle Temple; returning to Scotland, he entered Glasgow Univ. and became a minister of the kirk, taking charge successively at Newton-on-Ayr, 1851-4; Kirkpatrick Irongray, Dumfries, 1854-9; St Bernard's, Edinburgh, 1859-1865; and St Andrew's, 1865-99. In 1890 he was elected moderator of the General Assembly. As an author he won fame by his *Recreations of a Country Parson*, first contributed to *Fraser's Magazine*, an attractive series of articles followed by his *Graver Thoughts and Critical Essays of a Country Parson* (1862-1875).

Boyd, Mark Alexander (1553-1601), Brit. scholar. After a wild and unruly youth he left Glasgow College for the Continent, 1581, and he studied law at Paris, Orleans, and Bourges. In 1587 he served with Catholics in the League war for Henry III, but resumed his studies at Toulouse, 1588. In 1592 he pub. at Antwerp Lat. poems dedicated to James VI, and in 1595 he returned to Scotland, and was for a time travelling tutor to the Earl of Cassilis. His *Epistolae Heroïdes et Hymni* are to be found in Johnston's *Delicæ Poetarum Scotorum*, 1637. Among his prose and verse MSS. in the Scottish National Library are *In Institutiones Imperatoris Commenta* and *L'Estat du royaume d'Ecosse à présent*. See D. Dalrymple, *Sketch of the Life of Boyd*, 1787.

Boyd, Martin, see AUSTRALIAN LITERATURE.

Boyd, Robert (d. 1590), 4th Earl Boyd, Scottish statesman. According to some accounts he was privy to the murder of Darnley; in 1567 he was a member of the packed jury acquitting Bothwell of the deed. He fought for Mary Queen of Scots many times, and was employed by her on various occasions, one being to obtain her divorce from Bothwell. He was suspected of complicity in the murder of Moray, 1570; he then joined the regent's party, becoming a privy councillor and Morton's firm adherent after 1573 (appointed extraordinary lord of session). B. was a party to the 'raid of Ruthven,' and was banished for this, 1583; in 1586 he acted in negotiations for alliance between England and Scotland, and was restored to the bench.

Boyd, Zachary (1585-1653), Scottish minister, educ. at the univs. of Glasgow and St Andrews, afterwards student and then teacher, under his cousin Robert B., at the Protestant College of Saumur, France. When that in was treacherously occupied by Louis XIII in 1621, and the Huguenots were persecuted, B. returned to Scotland, and became minister of the Barony par., Glasgow, which then held its services in the crypt beneath the cathedral. In 1634-5 and 1645 he was rector of the univ. He was a noted preacher and a staunch Covenanter. On 13 Oct. 1650, a month after the battle of Dunbar, he had the courage to 'deal faithfully,' as the phrase went, with Cromwell, who was present, in a sermon at Glasgow Cathedral, but though political opponents, the 2 men respected each other in private life. B.

wrote many books, the best known being *The Last Battell of the Soul in Death*, 1629, and some books of verse, *Psalms of David in Meeter* and *Zion's Flowers*, the latter being metrical versions of Scripture, often known as 'Boyd's Bible.' His writings were marked by the quaint 'conceits' common in those times, but have force. His *Four Letters of Comfort* were reprinted in 1878.

Boyd Orr, John, 1st Baron (Orr, John Boyd) (1880-), physiologist and nutritional expert, b. Kilmaurs, Ayrshire; he was educ. at Glasgow Univ., where he took his M.A., M.D., and D.Sc. degrees. He entered the medical profession but gave up his practice to study animal nutrition at the Rowlett Institute of Animal Nutrition, Aberdeen, of which he was director until his retirement in 1945. During the First World War he served with the Royal Army Medical Corps. His work on *Minerals in Pasture and their Relation to Animal Nutrition* appeared in 1928, and four years later he became a member of the Reorganisation Committee for the Fat Stock Industry. He also served on other gov. organisations concerned with animal nutrition and milk supply. His researches, embodied in *The National Food Supply*, 1934, and *Food, Health, and Income*, 1936, were the basis of the rationing system in the Second World War. He was prof. of agriculture at Aberdeen Univ. from 1942 to 1945. In the latter year he was elected M.P. for the Scottish Univs., but resigned in 1946 on account of his work with the United Nations Food and Agric. Organisation, of which he was director-general. It was a period of acute world food shortage, and his proposals were successful in averting a famine situation. On his retirement from the Food and Agric. Organisation he became chancellor of Glasgow Univ. (1947). He was knighted in 1935 and created a baron in 1949. He was awarded the Nobel Peace prize for 1949.

Boydell, John (1719-1804), engraver and print publisher, b. Dorrington, Shropshire, and educ. for the Church; but early left his profession for art, about 1741 apprenticing himself to a London engraver. About 1751 he began the pub. of the works of other engravers, and in this direction was most successful, producing the work of Woollett, MacArdell, Hall, Earlom, Sharpe, Heath, J. Smith, Val. Green, etc. In 1790 he became Lord Mayor of London. His most famous production was the series of Shakespearian engravings which appeared in 1802, after pictures commissioned from well-known painters. These were exhibited in his Shakespeare Gallery, though this venture failed and he d. shortly after.

Boy-Ed, Karl (1872-1930), Ger. naval officer, b. near Hamburg. He was sent to Washington as naval attaché to the Ger. embassy there in 1911. On the outbreak of war he became known in the U.S.A. as director of Ger. espionage, and Wilson forced his recall from the country some time before America actually entered the war.

Boyer, Alexis (1757-1833), Fr. surgeon, b. Uzarches in the Corrèze. He was the son of a tailor, and acquired his first knowledge of medicine in the shop of a barber-surgeon. Proceeding to Paris he studied under Louis and Desault, and in 1794 became second operator at the Hôtel Dieu. A few years later he attracted the notice of Napoleon, who in 1804 appointed him his first surgeon and in 1807 made him a baron. When the New Academy of Medicine was created he was one of its first members, and after Napoleon's downfall he was surgeon successively to Louis XVIII, Charles X, and Louis Philippe. His prin. works were *Traité complet de l'anatomie*, 1797-9, and *Traité des maladies chirurgicales*, 1814-26. See J. F. Roux, *Boyer et Bichat*, 1851.

Boyer, Jean Pierre (1776-1850), a mulatto, b. Port-au-Prince, Haiti. He was educ. in France and, returning to his native country, joined the army. Toussaint l'Ouverture's Negro insurrection drove him back to France, where he served under Napoleon. Returning again to Haiti, he aided in the rebellion which overthrew Dessalines, the Negro President (1806). Haiti now broke up into 2 reps. under Pétion and Christophe. Siding with Pétion, B. became President in the N., and conquered almost all the is. In 1825 he obtained Fr. recognition of Haitian independence by paying 150,000 francs, but in 1840 a popular insurrection drove him from the is., and he fled first to Jamaica, then to Paris, where he d.

Boyle, Charles, 4th Earl of Orrery (1676-1731), author, b. Chelsea. He succeeded to the title in 1703. Educ. at Christ Church, Oxford, he pub. in 1695 an ed. of the Epistles of Phalaris which formed the start of his famous controversy with Bentley (q.v.) who proved that they were spurious. B. was an M.P. for a time, then entered the army, fought at Malplaquet, and became a major-general. In 1721 he was imprisoned in the Tower as a Jacobite. The orrery (q.v.) or moving model of the solar system, was so named in his honour by its inventor, George Graham.

Boyle, John, 5th Earl of Cork, 5th Earl of Orrery, and 2nd Baron Marston (1706-1762), son of Charles B. (q.v.), was educ. at Christ Church. Famous as a friend of Swift, Pope, and Johnson, in 1751 he pub. *Remarks on Swift*, a rancorous criticism of Swift's life and works.

Boyle, Richard, 1st Earl of Cork (1566-1643), Irish statesman, b. Canterbury; educ. privately and at Corpus Christi, Cambridge, and entered the Middle Temple, but in 1588 left England for Ireland. He was accused by Sir Wm Fitzwilliam, Sir Henry Wallop, and others, of theft and embezzlement, but put their accusations down to conspiracy, and was about to lay his case personally before Elizabeth in England, when the Munster rebellion broke out, and so reduced his fortunes that he was obliged to return to law in the Middle Temple. He was employed by Essex in Irish state business, and was again brought to trial at the instigation of Wallop, whose accusations he was able to refute. B. was then made

clerk of the council of Munster, and went over to England on missions to the queen in 1601 and 1602, on the last occasion making arrangements with Sir Walter Raleigh to purchase all his lands in Ireland, obtaining 12,000 ac. for £1000. This enormous estate he administered with firmness and energy, making improvements, and introducing new industries from England. In 1603 he was knighted, in 1606 became a privy councillor for Munster, in 1612 a privy councillor of state for Ireland, in 1616 was created Lord B., and in 1620 Earl of Cork, in 1629 became a lord justice, and in 1631 high treasurer for Ireland. The appointment of Wentworth (Strafford, q.v.) as lord deputy in 1633 involved him in difficulties, and Strafford's impeachment was no doubt partly due to B.'s skilful and inconspicuous opposition to him. B. was able to checkmate the rebels in Munster in the 1641 rebellion.

Boyle, Richard, 1st Earl of Burlington and 2nd Earl of Cork (1612-97), son of Richard B. (q.v.). He took an active part in the Irish rebellion, 1642; was created Baron Clifford of Lanesborough, Yorks, 1643; lord-lieut. of the W. Riding of Yorks, 1663; and Earl of Burlington, 1663. He was a supporter of William and Mary.

Boyle, Richard, 3rd Earl of Burlington and 4th Earl of Cork (1694-1753), was appointed privy councillor, 1714; lord-lieut. of the W. Riding of Yorks, lord high treasurer of Ireland, 1715. He had travelled in Italy, and while there acquired a love for architecture. In collaboration with the architects Flitcroft, Colin Campbell, and especially his protégé W. Kent (q.v.), he added a colonnade (since demolished) and other features to Burlington House in Piccadilly; and also had some share in the design of Chiswick House, c. 1725; the Dormitory of Westminster School, 1722-30; and the Assembly Rooms at York, 1731-2, as well as some other buildings no longer existing.

Boyle, Robert (1627-91), chemist and philosopher, b. Lismore, Ireland; educ. at Eton and by private tutors at home and on the Continent. In 1644 he returned to England, having inherited his father's manor of Stalbridge, Dorset. He began at once to show a fondness for scientific studies, and was influenced in this direction by the meetings of the Royal Society, then the Philosophical College, in 1645. While in England he made a speciality of chem., but on visiting Ireland in 1652-3 took up anatomy. In 1654 he settled at Oxford, and erecting a laboratory, was the leader of a small scientific society. About 1659, assisted by Robert Hooke, he invented the 'machina Boyleana,' the forerunner of the modern air-pump, and by means of experiments with the elasticity, weight, and compressibility of air, estab. B.'s law (q.v.) about 1660-2. In 1661 he pub. his *magnum opus*, *The Skeptical Chymist*, in which he overthrew the Aristotelian conception of the 4 elements and substituted the modern idea of an element, viz. a substance which cannot be decomposed

into simpler ones. This book was the foundation stone of modern chem. In 1668 he settled in London, where he became a prominent member of the Royal Society, and issued numerous scientific and philosophical works, corresponding with all the greatest men in these branches of learning throughout Europe. Throughout his life he was also an earnest student of theology, and subscribed largely to societies for the propagation of the Gospels. He appears to have been a man of singularly beautiful character, and was very popular, his reputation being international. His services to science were rather general than particular, but they were none the less valuable on this account, and he stands out as the originator of the 'experimental method.' Among his achievements may be mentioned the introduction of vegetable colour-tests of acidity, alkalinity, the preparation of phosphorus, and hydrogen, the construction of hermetically sealed thermometers, and the use of freezing mixtures, besides his researches into problems of elasticity and pressure. His complete works were pub. in 5 vols. in 1744.

Boyle, Roger, Baron Broghill and 1st Earl of Orrery (1621-79), Eng. statesman, soldier, and dramatist, *b.* Lismore; educ. at Trinity College, Dublin, Oxford, and on the Continent. On returning to England he held commands in the Scottish expedition, and the Irish rebellion of 1641-9, and later served under Cromwell in the subjugation of Ireland. Although a Royalist at heart, he supported Cromwell, and sat in his parliament, returning, however, to his old allegiance at the Restoration. He wrote dramatic and poetical works, which had some contemporary success.

Boyle, mrkt tn in co. Roscommon, Rep. of Ireland, 28 m. S.E. of Sligo, on both banks of the R. B. Has considerable agric. trade, and the ruins of a fine Clisterian abbey. There is a 9-hole golf-links. Pop. 2500.

Boyle Lectures (now discontinued), series of lectures founded in 1691 by the will of Robert Boyle, which provided £50 per year for a minister to preach 8 sermons in a year 'for proving the Christian religion against Atheists, Theists, Pagans, Jews, and Mohammedans, not descending to any controversies among Christians themselves.' (See LECTURES.)

Boyle's Law, law of the compressibility of gases. The temp. remaining the same, the vol. of a given quantity of gas is inversely as the pressure which it bears. This was discovered independently by Robert Boyle (q.v.), and by Mariotte. In England it is called Boyle's law, and in other countries, Mariotte's law.

Boileau, René (nom de plume of René Tardiveau), (1667-1726), Fr. novelist, *b.* La Haye-Descartes, Indre-et-Loire. His novels, marked by a close regard for style and respect for Fr. literary tradition, often describe prov. life. Among his best are *Le Parfum des Iles Borromées*, 1898, *Mademoiselle Cloque*, 1899, *Le Bel Avenir*, 1905, *Mon Amour*, 1908, *La*

Jeune Fille bien élevée, 1909, *Tu n'es plus rien*, 1917, *Elise*, 1921, and *Le Carrosse aux deux lézards verts*, 1922. He was elected to the Fr. Academy, 1919.

Boyne, Leonard (1853-1920), Irish actor. He made his début at the Theatre Royal, Liverpool, 1870, as Leybourne in *The Flowers of the Forest*. He then toured various trus in England and Wales, first appearing in London as John Ferne in Robertson's *Progress*, at St James's Theatre, 1874. B. also played in *Such is the Law* (1878); *A Gay Deceiver*, *Delilah* (as Col. Tempest); *Sister Mary*, *A Man's Love* (1889); *The Lights o' London*, *The Streets of London*, *The Trumpet Call*, *The Benefit of the Doubt* (1895); *For Auld Lang Syne* (1901); *Becky Sharp* (as Rawdon Crawley), and *The Marriage of Kitty* (1902). He also played *l'Alroy in Castle* (1889), and in *Our Boys*. He also acted in New York.

Boyne River, riv. of Rep. of Ireland, rises near Edenderry on the Offaly-Kildare border, and flows N.W. by Trim, Navan, and Drogheda, into the Irish Sea; total length about 70 m. It is famous in hist. for the battle of the Boyne, fought in July 1690 between William III and James II. The former had an army of Brit. and Dutch soldiers, with a regiment of Huguenot refugees; King James's army was numerically inferior composed mainly of Irish, with some Eug. and Fr. officers. After a bitter fight the Irish were defeated and James fled to France, his hopes of restoration to the throne at an end. An obelisk near Drogheda marks the scene of the battle. The Orangemen still celebrate 12 July as the anniversary of the battle.

Boynsburg (Bemelsberg), Konrad von (c. 1494-1567), Ger. knight, trained in warfare under Sickingen and Frundsberg. On the expedition to Italy, B. was chosen as Frundsberg's deputy, and on the latter's sudden illness became commander-in-chief. He distinguished himself at the storming of Rome (1527), the defence of Naples (1528), and the capture of Florence (1530). He fought also against the Turks and French. The last battle at which he was present was St Quentin, 1557.

Boys, Sir Charles Vernon (1855-1944), physicist, *b.* Wing, Rutlandshire, educ. at Cambridge and elected F.R.S. in 1888, distinguished as an original experimenter. In 1895 he devised a torsion balance in which fibres drawn from fused quartz were used. With this he repeated the work of Henry Cavendish (q.v.) and determined the universal constant of gravitation with greater accuracy than had been previously obtained. This was found to be 6.658×10^{-8} c.g.s. units, from which the mean density and the mass of the earth were obtained. He invented the radio-micrometer (q.v.), designed a calorimeter for measuring the thermal power of coal-gas, and made a moving lens camera for the study of rapid phenomena such as lightning.

Boys' Brigade, organisation for boys, founded in 1883 by Mr (afterwards Sir) Wm A. Smith, of Glasgow, with the object

of the advancement of Christ's Kingdom among boys, and the promotion of habits of obedience, reverence, discipline, self-respect, and all that tends towards a true Christian manliness. The B. B. consists of 2933 companies of boys between the ages of 12 and 18. Each company is connected with a church or other Christian body. Military drill is used as a means of banding the boys together, and of training them in discipline and self-respect. Bible classes, gymnastic training, ambulance work, bands, club-rooms, way-faring, athletics, swimming, and summer camps are extensively carried on. The B. B. is to be found in 29 overseas countries and in the Brit. Isles; Brit. membership is 105,680 (1956-7), officers and boys. An organisation for 9- to 12-year-old boys called the Life Boys (Brit. membership 72,758, 1956-7) provides the junior reserve for the B. B. The H.Q. of the B. B. are at Abbey House, London, S.W.1.

Boys' Clubs, National Association of (1925), gives free advice and help to its affiliated clubs through trained officers and specialist advisers. It pursues a vigorous policy of forming new Boys' Clubs wherever they are needed, particularly in recently developed areas such as new towns and housing estates. It maintains 2 national training centres where residential courses are held regularly for leaders and older boys on all aspects of club management and activities. Regional training is carried out partly by area organisations of Boys' Clubs and by the association's mobile training wing which tours the country and visits clubs whose leaders are unable to attend residential courses. At the end of 1955 there were 2118 clubs affiliated to the association with 164,800 members. Over 20,000 men and women were helping the movement in some capacity, mostly without payment.

'Adjustment to Industry' courses are held regularly for young employees and apprentices to give them a better understanding of their work and thus to create the right attitude towards it. The association holds ann. arts festivals and national football and boxing competitions. It also arranges an ann. conference for leaders and officers. The association receives generous assistance from the King George's Jubilee Trust and the King George VI Foundation. It also has an ann. grant from the Ministry of Education with whom it co-operates fully, but most of its income is raised from voluntary sources. The H.Q. are at 17 Bedford Square, London, W.C.1. See also YOUTH ORGANISATIONS OF GREAT BRITAIN.

'**Boy's Own Paper**,' monthly magazine of fiction and articles on adventure, hobbies, sport, science, and every possible subject of interest to intelligent boys between the ages of 12 and 18, with the main emphasis on the older boy. Production and contents are of high quality and the magazine, founded in 1879, now circulates in 53 countries.

Boz, pseudonym under which Dickens

(q.v.), having put together a loose pile of papers—satires on institutions, pictures of private persons, and fairy tales of the vulgarity of his world—decided to publish them with the title *Sketches by Boz*, 1836. *The Pickwick Papers* were at first pub. under the same name, 1837. 'Boz' was really a nickname of his brother.

Bozen, see BOLZANO.

Bozrah, possibly el-Busseirah, S.E. of the Dead Sea, anct. cap. of the Edomites; or perhaps Bozra in the Hauran, S. of Damascus, with anct. Rom. ruins, a populous medieval city, now only a vil.

Bozzaris, **Marcos** (1788-1823), Gk patriot, b. Sulí in Epirus. In 1821 he joined in the revolt against Turkish rule, but was defeated in 1822 at Petta and driven back to Missolonghi, which he defended very ably. He fell at Karpenisi whilst leading a daring night assault upon the Turkish-Albanian army, which was completely routed, although of far superior strength.

Bra, It. tn in Piedmont (q.v.), 25 m. N.E. of Cuneo (q.v.). It is the centre of a silk-worm breeding industry and is known for its market gardens. Pop. 22,000.

Brabançonne, **La**, Belgian national anthem, written and composed during the revolution of 1830, when Belgium broke away from Dutch rule. The words were by a Frenchman, Jenneval, the music by a Belgian, Camphout. Jenneval was killed near Antwerp, Oct. 1830.

Brabant, **Sir Edward Yewd** (1839-1914), S. African soldier, joined the Derby militia in 1855, and the year following went to S. Africa, where he joined the Cape Mounted Rifles. On the outbreak of the S. African war in 1899 he raised the corps known as 'Brabant's Horse' which did splendid service throughout the campaign. In 1900 he was made K.C.B., and in 1902 commandant-general of the Cape forces.

Brabant, name of a duchy, formerly part of Lorraine. Early in the 15th cent. the Duchy of B., through intermarriage, became incorporated with Burgundy, and on the marriage of Mary of Burgundy to the Emperor Maximilian was transferred first to the Austrian Empire, then under Charles V to the Sp. crown. During the Netherlands rebellion, N. B. became a Dutch prov., while S. B. remained Sp. till 1714; it then fell in turn to the Austrians, French, and Netherlanders. In 1830 the Belgians achieved their independence and S. B. is now their central prov. The eldest son of the King of the Belgians is called the Duke of B. S. B. is very densely peopled (area 1267 sq. m., pop. (1955) 1,887,782), and rich both in agriculture and manufs.; chief tns are Brussels, Louvain, and Nivelles. N. B. is larger, but poorer, being very marshy. Area 1920 sq. m.; pop. 1,354,363. Chief tn. s' Hertogenbosch. See W. A. Arendt, *The Brabant Revolution, 1789-1796*, 1843, and L. Van der Essen, *A Short History of Belgium*, 1920.

Brabazon, **Hercules Brabazon** (1821-1906), painter, b. Paris; the son of Hercules Sharpe, he took the name of B. on

succeeding to the B. estates in Ireland. He lived the life of a country squire, remaining an amateur in the arts, but nevertheless estab. a considerable reputation as a water-colourist in the Eng. tradition. He travelled widely in Europe and the Mediterranean, and his paintings are witness to this fact. See life by C. L. Hind, 1912.

Brabazon, Sir John Palmer (1843-1922), general, b. co. Mayo, Ireland. He joined the Grenadier Guards, exchanging later into the cavalry. His first campaign was in Ashanti, 1874. In 1878 he served in Afghanistan, and in 1880 shared in Roberts's famous march to Kandahar, and the victory over Ayub Khan's army on 1 Sept. In the Suakin campaign of 1884 he fought at E. Teb and Tamai, and served with the Light Camel Corps in the attempt to relieve Gordon, being present at the battle of Abu Klea (Feb. 1885). In the Boer War he led the second cavalry brigade, under French, during the operations round Colesberg (Jan. 1900), and afterwards commanded a div. of Imperial Yeomanry.

Brabazon of Tara, John Theodore Cuthbert Moore-Brabazon, 1st Baron (1884-), Brit. pioneer of motoring and aviation. He was educ. at Harrow and Cambridge. M.P. for Chatham Div. of Rochester, 1918-29, and Wallasey, 1931-1942, he held various gov. positions between 1923-7 and 1940-2. He holds the first pilot certificate granted by the Royal Aero Club and was a pioneer in the development of aerial photography.

Brađ (It. Brazza), Yugoslavian is. in the Adriatic, the largest is. of the Dalmatian archipelago. It is mountainous, and has sev. small vils. of which the prin. is Supetar (San Pietro). Pop. 26,000.

Bracara Augusta, see BRAGA.

Bracciano, Lake of (It. *Lago di Bracciano*; anct. *Lacus Sabatinus*), It. lake, in Lazio (q.v.), 15 m. NW. of Rome (q.v.). The basin is almost circular and of volcanic origin. The lake is 538 ft above the sea, but so deep that its floor is below sea level. It has always been famous for excellent fish. Around its shores are many ruins of Rom. and perhaps even earlier origin. Area 28 sq. m.

Bracciolini, Francesco (1566-1645), It. poet, b. Pistola. His talents gained him early admittance to the academy of Florence. Through the influence of Cardinal Barberini, later Pope Urban VIII, he became secretary to Cardinal Antonio Barberini, and went with him to France. His works include a heroic poem, *La Croce Racquistata* (The Cross Regained), ranked by some critics next to Tasso's *Gerusalemme Liberata*; *Lo Sclerno degli Dei*, an imitation of Tasso's *La Secchia Rapita*; and *L'Assedio della Rocella*, a heroic poem in 20 cantos. His poems, however, do not bear the stamp of a powerful creative imagination.

Bracciolini-Poggio, Giovanni (Gian) **Francesco** (1380-1459), It. scholar and humanist of the Renaissance, b. Terranuova d'Arezzo. He became secretary to the Rom. curia (c. 1403), but never showed interest in eccles. or political

affairs, devoting all his energies to unearthing old classical MSS. Among his discoveries were sev. orations of Cicero, some plays of Plautus, Lucretius' *De Rerum Natura*, Quintilian, and fragments of Valerius Flaccus, Silius Italicus, and others. He himself wrote moral essays, *Historia Florentina, 1350-1455* (1476), in imitation of Livy, and *Liber Facetiarum* (see Lisleux's ed., 1878; Hazlitt, Old English Jest Books, iii, 1864), a collection of humorous but often indecent stories aimed chiefly against the monks. Of his polemical invectives those against Filelfo and Valla are best known. He retired to Florence c. 1452, becoming chancellor and historiographer in 1453. His *Opere* were printed at Strasbourg (1510). See lives by W. Shepherd, 1802, and E. Walker, 1914; also V. Rossi, *Il Quattrocento*, 1933.

Bracebridge, small tn in Canada, situated on the Muskoka It., in Muskoka co., Ontario. It is about 120 m. N. of Toronto. Pop. 2762.

Bracegirdle, Anne (c. 1663-1748), actress. The date of her birth is usually assigned to 1663, but by some it is put 10 years later. She had a brilliant career on the stage till, in 1707, she and her rising rival, Mrs Oldfield, played Mrs Brittle in Betterton's *Amorous Widow* on successive nights. The audience awarded the palm to Mrs Oldfield, whereupon B. then quitted the stage, never to return, except for Betterton's benefit performance in 1709. She achieved her greatest successes as an actress in the plays of Congreve (q.v.), to whom she was suspected of being secretly married.

Bracelet (O.F. dimin. of *bracel*, from Lat. *brachiale* (brachium, arm)), ornament worn from time immemorial by both sexes. B.s are repeatedly mentioned in the Bible; Abraham's servant presented Rebekah with 2 gold B.s (Gen. xxiv. 22), and one was taken, probably a royal armlet, from Saul as he lay dead on Mt Gilboa (2 Sam. i. 10). Throughout the E. in ant. times, an armlet of plain or enamelled metal was a regal ornament; Egyptian kings are represented as wearing such, and B.s are still worn by E. princes. Among the Lat. tribes *armillae* were very massive; Petronius Arbiter says they sometimes weighed over 6 lb. The Romans often awarded them as decorations for valour, to their own people only; on foreigners torques or other ornaments might be bestowed. B.s were often given in Rome as birthday or wedding presents; as a rule virgins did not wear them. Among the Greeks, who got their first designs from Asia, the snake pattern was common, also penannular hoops with finial decorations. Among early Teutons and Scandinavians bronze armlets were often very large, protecting the whole fore-arm, and B.s were given to brave warriors; in the Saxon Chronicle King Edgar is called 'bestower of Bracelets', as is also Athelstan (*Song of Brunanburh*); this term is applied to great chiefs. Very anct. B.s were simple in pattern, of easily worked metals, gold, silver, copper, and bronze. As skill and luxury increased, choice of

materials was more varied, brass, polished steel, etc., being used, and jewels being employed in the decorations, especially in India and Persia, where these ornaments were often of fabulous cost. One pair of B.s, taken at the sack of Delhi by Nadir Shah (1739), was valued at a million sterling. Designs multiplied greatly; highly wrought panels joined by clasps were among the triumphs of Etruscan art. Among barbaric tribes beads and plaited wire are much used to this day; the Kaffirs of S. Africa are skilful in making B.s of the latter material.

Braces (cf. Fr. *bras*), ropes attached to the yard-arms of vessels, by means of which the yards can be swung round and so the sails 'trimmed.'

Brach, term derived from the O.F. *braque*, *bracket*, dimin. of *brac*, from Old High Ger. *bracco* or *brueco*, to indicate a scenting or hunting dog of the hound type. It is applied to the female.

Brachial Artery, artery of the upper arm. It is a continuation of the axillary artery, and proceeds from the armpit downwards and outwards along the inner side of the arm, reaching the middle of the bend of the elbow. Its branches are the *superior profunda*, springing from the inner and back part of the brachial soon after its commencement; the *inferior profunda*, a smaller artery springing from the middle of the brachial; the *anastomotie*, providing the anastomoses at the elbow; and muscular branches to the muscles of the upper arm. The brachial subdivides in the lower arm into the radial and ulnar arteries.

Brachial Plexus, aggregation of nerves in the lower part of the neck and armpit. The nerves engaged are the fifth, sixth, seventh, and eighth cervical and the first dorsal spinal nerves. See SPINE AND SPINAL CORD.

Brachinus, genus of coleopterous insects of the family Carabidae, of which sev. species are Brit. See BOMBARDIER BEETLE.

Brachionus, genus of microscopic and aquatic beings of the phylum Rotifera and order Ploima. They have a long, flexible foot ending in 2 toes, and they swim by means of minute cilia. *B. uveolarius* is the commonest species.

Brachiopoda, phylum of marine bottom-dwelling bivalved invertebrate animals, with 2 dissimilar but bilaterally symmetrical valves which lie dorsally and ventrally and enclose the soft parts. They bear some affinity to the Polyzoa, but the resemblance to the Lamelli-branchia, or true bivalves, is superficial. In the latter the shells lie right and left, are equal and unsymmetrical about the median line. B. possess brachia, or arms, bearing cilia which produce currents of sea-water to bring food to the mouth and carry away waste materials, besides enabling the mantle lobes to perform their respiratory function. In the primitive Inarticulata the valves are kept together by muscles, but in the more advanced Articulata the valves are united by a strong hinge. Most B. were attached by means of a stalk or pedicle.

They are amongst the oldest known fossils, were abundant in Palaeozoic times, but have since declined steadily. There are about 1400 fossil genera, but only about 60 living genera. B. are widely used as index fossils in correlating strata. See T. Davidson, *Monograph of the British Fossil Brachiopoda*, 1851-84; T. H. Huxley, *Contributions to the Anatomy of the Brachiopoda*, 1854; H. M. Muir-Wood, *A History of the Classification of the phylum Brachiopoda*, Brit. Museum (Nat. Hist.), 1955.

Brachycephalic (Gk *brachus*, short; *kephalē*, head), term applied to skulls of which the transverse diameter is more than eight-tenths of the long diameter.

Brachycerus, genus of coleopterous insects of the family Curculionidae, which are apterous and generally very rough. These weevils live on the ground in S. Europe and Africa. See COLEOPTERA and WEEVIL.

Brachypodium, or false brome-grass, genus of tropical and temperate Gramineae, of which there are 2 Brit. species, *B. sylvaticum* and *B. pinnatum*. The former grows in woods, the latter on open heath; the inflorescence is a simple raceme with unequal glumes.

Brachypteryx Montana, or mountaineer warbler, bird of the family Timeliidae, or babbling thrushes. By the Javanese it is known as *ketek*. In colour it is indigo, black, and white, in song it is garrulous and plaintive, in habit it is insectivorous, and builds its nest on the ground. It inhabits the wooded peaks of Java.

Brachyteles, woolly spider monkey, genus of Cebidae, consisting of 3 species of prehensile-tailed monkeys found in America. They have woolly hair, but the long tail is naked towards the tip, and the pollex is reduced.

Brachyura (Gk *brachus*, short; *oura*, tail), term applied to a large group of decapod crustaceans which are characterised by having the short tails tucked up beneath them, e.g. the crabs, thus differing from the long-tailed crustaceans like the lobsters. The term is also applied sometimes to very short-tailed bats, and *Brachyurus* to a genus of short-tailed monkeys of S. America.

Bracken, **Brake** (*Pteridium aquilinum*), species of Polypodiaceae common in Great Britain. It has a creeping rhizome which grows at some depth below the surface of the soil, and sends up every year 1 large much-divided leaf, known as a frond, at the base of which there is a nectary. On the back of the leaf-stalk it produces adventitious buds. In the B. there is a true lateral indusium, which is a delicate membrane of a yellow colour, and the margin of the pinnae bends over to protect the sporangia, thus forming a false indusium.

Brackenbury, Sir Henry (1837-1914), soldier and military writer, b. Bolingbroke, Lincs; he joined the Royal Artillery in 1856, and served in central India during the mutiny. In 1870-1 he assisted in the work of relieving the sick and wounded in the Franco-Ger. war. He went through the fighting in Ashanti

in 1874, and in 1879-80 served as chief of staff in the Zulu war. In 1884-5 he led the riv. column in the Sudan campaign and was promoted to be major-general. Director-general of ordnance, 1899-1904. His writings include *The Last Campaign of Hanover*, 1870, *Narrative of the Ashanti Column*, 1885, and *Some Memorials of my Spare Time*, 1909.

Brackenbury, or Brakenbury, Sir Robert (d. 1485), member of a Durham family, constable of the Tower of London. He fought against the rebels under Buckingham and was rewarded with various grants by Richard III. He was made constable of the Tower for life in 1483. B. is said to have refused to murder the 2 little princes, but to have handed over his keys to Tyrrell at Richard's command. He was killed fighting for Richard at Bosworth, 1485.

Bracket, metal or wooden support which projects from a wall. B.s have 2 uses. In architecture they support heavy weights, such as balconies, and as articles of furniture they are used to support much lighter things, such as lamps and ornaments of all kinds.

Bracklesham Beds, Upper Eocene estuarine and marine sands and clays exposed in Britain in the London and Hants basins.

Brackley, Viscount, *see* ELLESMERE.

Brackley, mkt tn and bor. in Northants, 6 m. from Silverstone car race track; chief industries are brewing and boot-making. Once had considerable wool trade, and sent 2 members to Parliament; has fine church, and school founded by William of Waynflete, 1447. Pop. 3000.

Brackwede, Ger. tn in the *Land of N.-Rhine-Westphalia* (q.v.), 90 m. NE. of Düsseldorf (q.v.), with metal industries. Pop. 22,000.

Bracoon, typical genus of the Braconidae in the Hymenoptera. It is a large genus, widely distributed in Britain, with parasitic larvae, and differs from the Ichneumon-flies in having the cubital cell of the fore-wing separated from the second cubital by a single cell.

Braot, or **Hypophyll**, in botany, a modified tissue-like scale-leaf, growing near the calyx or peduncle or pedicel of a flower. Some plants are without B.s and are termed *ebracteate*; those with B.s are called *bracteate*. Some plants have smaller scale-leaves between the B.s and the flowers, known as *bracteoles* (e.g. *Scilla*). B.s may be scaly, leafy, membranous, woody, or coloured. They may be petaloid as in *Cornus*; form a calyx-like structure known as an *involucre* as in *Anthyllis*; or a cup known as a *cupule* as in the oak acorn, or flower protection or *spathe* as in the arum.

Bratton, Henry de (d. ? 1268), judge and writer on law. He was clerk in the king's service in the early part of his career, under the patronage of Wm Rayleigh. In 1245 he appeared as justice, and from 1248 until his death was a justice of assize in Somerset, Cornwall, and Devon. For a time he was also employed as judge in the king's central court, but 1257 saw

him dismissed, probably owing to his connection with political events of that period. In 1259 he was made rector of Combe-in-Teignhead, and 2 years later he became rector of Barnstaple; in 1264 he became archdeacon, and a year or so before his death he attained to the chancellorship of Exeter Cathedral. His fame is chiefly due to his treatise on the laws and customs of England, the greater part of which was compiled 1250-8; this, although unfinished, is considered the best work of any Eng. lawyer of the Middle Ages.

Bradbury of Winsford, John Swanwick Bradbury, 1st Baron (1872-1949), civil servant, b. Winsford, Cheshire, and educ. at Manchester Grammar School, and at Brasenose College, Oxford. He entered the civil service in 1896, and became joint permanent secretary of the Treasury and K.C.B. in 1913. His name suddenly became widespread on the outbreak of war in 1914; when, on the disappearance of gold currency, there came the issue of the treasury note for 1 pound, which was for some years popularly known as a Bradbury because of the signature of the secretary of the Treasury that appeared prominently upon it. B. ceased to be secretary of the Treasury in 1919, and was prin. Brit. representative on the reparations commission at Paris, 1919-25. B. was raised to the peerage, 1925.

Braddock, Edward (c. 1695-1755), Brit. general, b. Perthshire. He entered the army in 1710. During the later years of the war of the Austrian Succession he fought in Holland, being then a lieutenant-colonel. In 1754 he was made a major-general, and in the following year he went to Virginia to command the Brit. forces against the French. He was much hindered by the supply arrangements, but finally took the field with about 2000 men, amongst whom was George Washington, and he attempted an attack upon Fort Duquesne (now Pittsburgh). The column fell into an ambush of French and Indians, and were completely routed; B. himself, after conspicuous gallantry, was shot and fell mortally wounded.

Braddock, bor. in Allegheny co., Pennsylvania, U.S.A. It is situated on the R. Monongahela in SW. Pennsylvania, about 10 m. SE. from Pittsburgh, at an altitude of 830 ft. There are extensive iron and steel works in the neighbourhood. Pop. 16,488.

Braddon, Mary Elizabeth (1837-1915), novelist, b. London. Her first success was *Lady Audley's Secret*, 1862, which she followed up with *Aurora Floyd* and *Eleanor's Victory*, 1863, and *Henry Dunbar*, 1864. These are all 'sensational' novels, constructed on melodramatic lines, with skilful and exciting plots and plenty of variety. Though never rising to the highest levels of fiction, Miss B., who wrote 70 novels, showed sustained powers, *Beyond these Voices*, pub. as late as 1910, being pronounced equal to its predecessors. Among her later novels may be mentioned *The Green Curtain*, 1911, and *Miranda*, 1913. Sev. of her stories

appeared as serials in *Belgravia*, which she ed. for many years. In 1874 she married John Maxwell, publisher, and their son, W. B. Maxwell, won considerable repute as a novelist and journalist.

Bradfield, John Job Crew (1867-1943), engineer; educ. at Ipswich Grammar School and at Sydney Univ., New S. Wales. He graduated at Sydney in engineering up to his doctorate, winning first-class hon. and the univ. medal at each stage. In 1891 he entered the Public Works Dept of New S. Wales, but later set up in private practice. He was consulting engineer for the design and construction of the Brisbane R. bridge and approaches; but will be chiefly remembered as the designer and chief engineer of the great bridge across Sydney Harbour. He also designed and supervised the construction of the Sydney city underground railway. B. was a member of the Sydney Univ. Senate and a fellow of the Australian and New Zealand Research Council.

Bradfield, vil of Berks, England, about 9 m. from Reading. Here is B. College (q.v.). Pop. 2000.

Bradfield College, public school for boys, founded 1850 by Thomas Stevens, rector and lord of the manor. Since 1890 Gk plays have been performed every 3 years in the school's open-air Gk theatre. In 1939 there were 9 serving Brit. admirals who had been boys at the school.

Bradford, Andrew (1686-1742), Amer. printer and publisher, son of Wm B. (q.v.), the printer. In 1719 he began the issue of the *American Weekly Mercury*, the first newspaper in Pennsylvania. In 1741 his *American Magazine* ran for only 3 issues.

Bradford, Sir Edward Ridley Colborne (1836-1911), Brit. soldier; joined the Madras cavalry in 1853. During the mutiny he distinguished himself in the operations against Tantia Topce, and afterwards acted first as political agent, then as head of the criminal dept concerned with Thuggism, and later as political secretary to the Indian Gov. Returning home, he was in 1890 appointed commissioner of police in London. He was made G.C.B. in 1897, and baronet on his retirement in 1903.

Bradford, John (c. 1510-55), Eng. Protestant preacher. Rather reckless in youth, he was educ. at Cambridge (becoming fellow of Pembroke Hall), and converted by Latimer. B. became Ridley's chaplain, 1550; prebendary of St Paul's, 1551; royal chaplain to Edward VI, 1553. His preaching won praise from John Knox. Tried before Gardiner and Bonner, he was burned at Smithfield under the Marian persecutions. B.'s writings were ed. by Townsend for the Parker Society, 1848-53. See Stevens's life, 1832.

Bradford, Samuel (1652-1731), Eng. bishop, educ. at St Paul's School and, after the plague and fire, at Charterhouse; went to Cambridge, 1669, leaving without a degree because of religious scruples. Studied medicine for a time; in 1680 was admitted to degree of M.A. by royal

mandate; 1697, was incorporated at Oxford. B. took orders after the revolution, becoming deacon and priest, 1690. In 1691 the governors of St Thomas's Hospital elected him minister of their church in Southwark. Became tutor to grandsons of Archbishop Tillotson, being made rector of St Mary-le-Bow, 1693; B. often preached before the corporation of London, and lectured at various places. He was a staunch Whig and Protestant; 1698, William III made him royal chaplain in ordinary. He continued in office under Anne, becoming prebendary of Westminster, 1708. His sermons on 'The Credibility of the Christian Revelation, from its Intrinsic Evidence,' were pub. with others in *A Defence of Natural and Revealed Religion*, 1739. Bishop of Carlisle, 1718; Bishop of Rochester and dean of Westminster, 1723.

Bradford, William (1590-1657), Amer. colonial governor and historian, b. Yorks, England. As a 'Pilgrim Father' he sailed in the *Mayflower*, 1620, to Plymouth, New England. B. succeeded Carver as governor of this settlement, 1621, ruling firmly and wisely, and showed tact in dealing with the Indians. He was author of *History of Plimouth Plantation*, pub. in the *Proceedings of the Massachusetts Historical Society*, 1856; also of *Dialogues* on church gov.

Bradford, William (1663-1752), Amer. colonial printer, b. Leics, England; emigrated with Penn to Pennsylvania, where in 1685 he introduced printing into the middle colonies, his first imprint being an almanac, *America's Messenger* (1685). His press, having been seized on his issuing a tract for the minority sect of Friends, was restored to him by Governor Fletcher on appeal. Removing to New York in 1693, he became royal printer for the colony, holding the post for 50 years or more, and issuing in 1725 the first number of the *New York Gazette*; he continued it for 19 years.

Bradford, William (1719-91), Amer. printer and publisher, grandson of above; estab. in 1742 the *Weekly Advertiser* or *Pennsylvania Journal*. He served in the War of Independence, rising to the rank of colonel.

Bradford, William (1755-95), Amer. jurist, son of above, also served in the War of Independence, afterwards becoming first attorney-general of Pennsylvania, then judge of the supreme court of that state, and finally attorney-general of the U.S.A. (1794-5).

Bradford, city, municipal and co. bor. of the W. Riding of Yorks, England, has been connected with wool in one form or another for over 6 cents. From the Middle Ages for 3 cents, or more woollen manufacturing was its staple industry; but in the 17th cent. the worsted trade began to drift from E. Anglia to the N. and B. became one of the chief seats. It is now the world's central market for wool, and wool and mixture products. B. is a comparatively modern city, and a place of rapid growth since the beginning of the industrial revolution. The worsted trade prospered exceedingly in B., even under

the conditions of hand labour, but of course the steady growth of those early days bore no comparison with the boom which came afterwards with the introduction of steam power and the factory system. B. also profited greatly by the paralysis of Amer. manufacturing caused by the Civil war, and much more during the Franco-Ger. war of 1870-1. It is estimated that the total value of the production of the wool textile industry before the Second World War was about £200,000,000. In 1950 the value of exports of wool yarns and manufs., excluding carpets, was £141,000,000; the total output, excluding carpets, was about £514,000,000. B. is chiefly concerned with the treatment of textile materials and their conversion into finished goods. It is the great centre of the sorting of fleeces as they come from dominion and foreign sources, or from the home farmer. The city is also the world's chief manipulator of the production, by the process of combing, of wool 'tops' (long fibres) and 'nolls' (short fibres) and wastes of various kinds. It produces great quantities of worsted coatings for men, of linings for garments and, in great abundance, the materials for women's wear. Mercerised cotton goods are also a great feature, and altogether there are now sev. hundred large factories for the weaving of worsted, velvet, plush, alpaca, mohair, silk, and rayon, and mercerised cotton fabrics. A few of the largest firms have their own dyeing and finishing plant, but in regard to the bulk of the products of the mills, they must pass, at one stage or other of the processes of manuf., into the care of the separate dyer. Engineering is another great industry of B. The making of boilers, condensing plant, pumps, marine machinery, lift machinery, machine tools, and motors is carried on upon a large scale. Electrical engineering has also come into prominence; products include all kinds of electric generators and motors for industrial and domestic purposes; the complete electrical equipments, including the traction motors for electric and diesel-electric locomotives and railway coaches, and for tramcars and trolley-buses. Other industries are stone quarrying, brewing, buildings, structural engineering and public works contractors, manuf. of disinfectants, photo engraving, printing and publishing, etc. B. is connected with the Mersey and the Humber by canals, and is an important railway centre. There are many fine public buildings, including the cathedral the site of which probably dates back to the 14th cent., when the church was rebuilt by the de Lacys. B. was created a bishopric in 1920. A scheme for the restoration of the cathedral has been begun, and the year 1958 has been set as the time for completion. The tn hall has a tower which contains a very fine clock, with carillon chimes. The building was completed as to its first design in 1873, and enlarged later, but has now become inadequate. Other notable buildings are the Forster Square railway station of the N.E. Region of Brit. Railways which, with its

hotel, cost over £1,000,000; the chamber of commerce (called Commerce House), a 7-storey building; the Cartwright Memorial Hall in Lister Park, B.'s art gallery and museum, and the most ornamental piece of architecture in the city; St George's Hall (1853), once the general public assembly place of B., acquired by the corporation in 1952, and opened in the autumn of 1953 for orchestral and other concerts, public meetings, and exhibitions; the post office, built at a cost of £250,000; the exchange, with a fine statue of Cobden; and Bowling Hall, the only building of any antiquity apart from the cathedral. City statutes include those of Peel, W. E. Forster, Sir Titus Salt, and Richard Onstler. The existing charter of the B. Grammar School was granted by Charles II (1662), but the foundation dates back to an unknown time before the reign of Edward VI. B. Girls' Grammar School was estab. in 1875. There is a college of art and the technical college is one of the largest of its kind in the country (founded 1880). The Mechanics' Institute originated in 1832, though the present building was only erected in 1871. The parks include Lister Park, better known as Manningham Park, containing, besides the Cartwright Memorial Hall, a recording station of the meteorological section of the Air Ministry, and open-air swimming pools which, after great alterations, were reopened in 1939; Baildon Moor (870 ac.), kept as a recreation ground; and Horstall playing fields.

Records of B. indicate that in the reign of Edward the Confessor the manor was in the hands of one Gamel, and was valued at 'four pounds troy weight of silver.' During the Norman conquest of the N. of England it appears to have been destroyed, for the Domesday entry says enigmatically 'Ilbert hath it; it is waste.' The Ilbert referred to was a de Lacy, in which family the manor continued until the 14th cent. In 1311 the pop. was 650, and there was already a fulling mill yielding £1 per annum. The mention of the fulling mill in 1311 indicates that the woollen industry had already become estab. in the tn, and by the 16th cent. it had become an important part of the life of the tn. A weekly market was granted in 1251, and confirmed in 1294. Edward IV, in 1481, also confirmed the market, and granted 2 ann. fairs. In 1540 Leland visited the tn and in his *Itinerary* said that 'it standeth much by clothing' and was 'a praty quik town.' The first B. mill was estab. in 1798, and by 1841 there were 70. In 1847, the year in which B.'s progress to modern prosperity began, the united townships of B., Manningham, Horton, and Bowling were granted a charter of incorporation. The tn was not represented in Parliament before 1832, when it was created a parli. bor., returning 2 members; it was evidently a bor. of prescription until 1847. In 1885 there were 3 members and in 1918 4. In 1907 B. received the honour of a lord mayor. Pop. 286,000.

Bradford, tn in McKean co., Pennsylvania, U.S.A., in a rich oil-producing dist.

It has large petroleum refineries, also manufs. iron ware, glass, chemicals, etc. Pop. 17,350.

Bradford-on-Avon, mrkt tn in Wilts, near Bath, England. St Aldhelm was abbot of B. monastery in AD 705, and the little church of St Lawrence, still perfect, dates from Saxon times. B. is mentioned as a bor. in Domesday Book. On the tn bridge (rebuilt in the 15th cent.) there is a chapel, used as a lock-up for the last 250 years. Kingston Hall (c. 1600) is a fine example of a prosperous cloth merchant's house. Under the Stuarts it was the chief cloth-manufacturing tn in the W. of England, but is now principally concerned with light industries and the making of rubber goods. Pop. 5500.

Brading, vil. 4 m. S. of Ryde, in the Isle of Wight, with a bull ring and the remains of a Rom. villa. Pop. 2000.

Bradlaugh, Charles (1833-91), free-thinker and politician, b. Hoxton, London, the son of a solicitor's clerk. At 17 he enlisted as a soldier, but bought himself out after a few years. He then became a 'free-thought' writer and lecturer, calling himself 'Iconoclast,' and gradually rose to be a prominent leader among 'advanced' political societies, Reform Leaguers, Secularists, and Land Law Reformers. His advocacy of atheistical opinions aroused intense opposition, and for some years he was attacked both in the law courts and the press. This antagonism was in 1876 intensified by his republishing, in alliance with Annie Besant (q.v.), an Amer. pamphlet on birth control which had already been condemned by an Eng. court of law. Both were sentenced to a heavy fine and imprisonment, but the conviction was quashed on technical grounds. B. had for some years been seeking to enter Parliament, and in 1880 was elected for Northampton; refusing, however, to take the oath he claimed liberty to affirm under the Parl. Oaths Act, but he was rejected by the House. After being re-elected 4 times, he was at last permitted to enter, on affirming, in 1886. See life by J. Gilmour, 1933.

Bradley, Andrew Cecil (1851-1935), scholar, b. Glasbury, Brecknock, brother to Francis Herbert B. (q.v.) and half-brother to George Granville B. (q.v.). Educ. at Cheltenham and Balliol College, he was elected fellow of Balliol in 1874, and lectured there from 1876 to 1881. He was prof. of modern literature at Univ. College, Liverpool, from 1881 to 1889, and at Glasgow Univ. from 1889 to 1900, then prof. of poetry at Oxford from 1901 to 1906. He pub. *A Commentary on 'In Memoriam'*, 1901, *Shakespearean Tragedy*, 1904, *Oxford Lectures on Poetry*, 1909, and *A Miscellany*, 1929.

Bradley, Edward (1827-89), Brit. clergyman and writer. He graduated at Durham Univ. in 1848, and was ordained in 1850. As a contributor to *Punch*, under the name Cuthbert Bede, he was well known to his contemporaries, but his claim to posthumous fame rests on his *Adventures of Mr Verdant Green*, an *Oxford Freshman*, 1853. It is full of fun,

and, considering the author was not an Oxford man, remarkably true to life.

Bradley, Francis Herbert (1846-1924), philosopher, b. Glasbury, Brecknock, brother to Andrew B. (q.v.) and half-brother to George B. (q.v.), dean of Westminster. Educ. at Univ. College, Oxford, he became a fellow of Merton. Prin. works: *The Presuppositions of Critical History*, 1874; *Ethical Studies*, 1876 (reissue with additions, 1927), in which he attacked Utilitarianism; *The Principles of Logic*, 1883 (revised, 1922); *Appearance and Reality*, 1893; *Essays on Truth*, 1914. To the world at large he will be memorable for his irreverent definition (in the preface to *Appearance and Reality*) of Metaphysics: 'The finding of bad reasons for what we believe upon instinct.' Awarded the O.M., 1914.

Bradley, George Granville (1821-1903), scholar and divine, b. High Wycombe. He was educ. at Rugby under Arnold, and at Univ. College, Oxford, where in 1844 he was elected a fellow. In 1858 he was appointed headmaster of Marlborough, where he was very successful. His personal influence was remarkable; Tennyson said he sent his son 'not to Marlborough but to Bradley.' Returning to Univ. College in 1870 as master, and finding the standards both of discipline and learning only moderate, he set to work as a reformer with such success that admission to his college became an honour to be competed for. On Dean Stanley's death in 1881, B. was chosen to succeed him as dean of Westminster. After the coronation of Edward VII (Aug. 1902), Dean B. retired from office. He was buried in the abbey. His *Life of Dean Stanley* was pub. in 1892.

Bradley, Henry (1845-1923), philologist, b. Manchester, son of John Bradley of Kirkby-in-Ashfield and his second wife—who in 1846 removed with their family to Brimington near Chesterfield. They were Congregationalists, and Henry adhered to the same denomination. He was educ. at Chesterfield Grammar School. He married in 1867, and soon had a considerable family. He wrote notes for the *Sheffield Independent*—chiefly on place-names, a subject upon which he soon became the recognised authority. He went to London in 1883, and became a contributor to the *Academy* and the *Athenaeum*. The editor of the former handed him for review the first instalment of James Murray's *New English Dictionary* (the great 'Oxford Dictionary'), and the critique he wrote induced Murray to invite him to join in the editorship. This he did not immediately do, but he was an early contributor. He was temporary editor of the *Academy*, Oct. 1884 to May 1885. He began editorial work on the great dictionary in Jan. 1888. Early in 1892 he broke down through overwork, and was sent to Norway, where he regained health; meanwhile he was granted a Civil List pension of £150, and £200 from the Literary Fund. In 1896 he removed to Oxford, where he devoted himself entirely to the dictionary, becoming editor-in-chief

on Sir James Murray's death in 1915. His chief original works are *The Story of the Goths*, 1887, and *The Making of English*, 1904; as editor he brought out sev. important works, including *Caxton's Dialogues* (Early Eng. Text Society), 1900, and a revision of Morris's *Elementary Lessons in English Grammar*. See his *Collected Papers*, with a memoir by Robert Bridges, 1928.

Bradley, James (1693-1762), astronomer, b. Sherborne. He entered Oxford in 1711, and became F.R.S. in 1718. He took orders in 1719, but resigned his benefice in 1721 in order to take up the professorship of astronomy at Oxford. His observations of the star γ Draconis from 1725 to 1728 showed that it described a small ellipse in the sky and he put forward his reasons for the phenomenon soon afterwards (see ABERRATION). Later on he explained also the phenomenon of nutation (q.v.). In 1742 he became astronomer royal. During the last 12 years of his life he did very valuable work in the observations of star positions.

Bradley, Katharine Harris, see FIELD, MICHAEL.

Bradley, Margaret Louisa, see WOODS.

Bradley, Omar Nelson (1893-), Amer. general, b. Clark, Missouri, educ. at the U.S. Military Academy, W. Point, and commissioned in 1915. He held a number of appointments, including that of secretary to the general staff, and in 1943, during the Second World War, he took command of the U.S. 2nd Corps in the N. African campaign, being present in the final drive against the Germans in Tunis. In this campaign he held the rank of lieutenant-general (temporary), and was given the permanent rank of major-general in Sept. 1944. In Jan. of that year it was announced by Gen. Eisenhower that B. was to lead the ground forces in the invasion of Europe, and throughout the fighting in Normandy, and subsequently, he commanded the U.S. Twelfth Army Group, which in Aug. was made independent of the Brit. Twenty-first Army Group, commanded by Gen. (later F.M.) Montgomery, thus giving the 2 commanders equal status. The U.S. Twelfth Army Group comprised the Amer. First, Third, Ninth, and Fifteenth Armies (see WESTERN FRONT IN SECOND WORLD WAR). B. was promoted full general (temp.) in 1945. K.C.B. (hon.), 1944; and succeeded Gen. Eisenhower as chief of staff of the U.S. Army in 1947, and served until 1949, when he became chairman, joint chiefs of staff. Retired 1953. He wrote *A Soldier's Story*, 1951.

Bradman, Sir Donald George (1908-), Australian cricketer, b. Cootamundra, New S. Wales. Educ. at Bowral Intermediate High School. He first played for Australia in 1928 against the M.C.C. team. At Sydney, in 1929-30, he beat previous records by scoring 452 not out in 415 minutes against Queensland. In the second innings of his first test in England at Trent Bridge (1930) he made 131, following with 254 at Lord's, 334 at Leeds, and 232 at the Oval. The Leeds innings

beat the record individual score in test matches between England and Australia which had been held by R. E. Foster since 1903-4 with 287 at Sydney. He led the Australian eleven against England in England in 1934, in Australia in 1936-1937, in England in 1938, in Australia in 1946-7, and in England in 1948. His test match average in 1946-7 was 97.14. In the 1938 season he made 13 cents. In 1938-9 he scored 6 consecutive cents. (a feat also accomplished by C. B. Fry in 1901). He is among the few cricketers to



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make 1000 runs before June, achieving the distinction in 1930 and again in 1938. His batting average of 115.66 in 1938 is the highest ever recorded in England. In his final season before retirement from test cricket (1918) at the age of 40, his aggregate was 2428, his highest score 187, his average 89.92, and in that season he scored 11 cents. In this last season he had the satisfaction of leading a team which sustained no defeats. Knighted 1949.

Bradshaw, George (1801-53), publisher, b. Pendleton, Lancs. He was in business at Manchester as a map-engraver and printer when the railway era began, and in 1839 he pub., at sixpence, the first of his *Railway Time Tables*. In 1847 he began his *Continental Railway Guide*. He was a member of the Society of Friends.

Bradshaw, Henry (c. 1450-1513), Benedictine monk and poet, b. Chester. He studied theology at Oxford, and then

returned to his monastery at Chester. His *De Antiquitate et Magnificentia Urbis Cestriae* is lost, but the *Life of St Werburgh*, largely a compilation, was pub. in 1521. It is written in Eng. 7-line stanzas.

Bradshaw, Henry (1831-6), scholar and librarian, b. London. He was educ. at Eton and King's College, Cambridge, of which he became a fellow, 1853. After a short scholastic career in Dublin he returned to Cambridge as assistant in the univ. library, where he compiled a catalogue of the MSS. His discovery in 1857 of the *Book of Deer* threw light on ancient Celtic language and literature. Another discovery was that of MSS. containing the earliest remains of the Waldensian language and literature. In 1866 he discovered 2 previously unknown poems—*Legends of the Saints*, and some lines on the *Siege of Troy*, which he found in a MS. of *Lydgate's Troye Books*. He was univ. librarian, 1867-86. His *Collected Papers* were pub. by F. Jenkinson, 1889. See memoir by Sir G. W. Prothero, 1888, and C. F. Newcombe, *Some Aspects of the Work of Henry Bradshaw*, 1905.

Bradshaw, John (1602-59), judge and regicide, b. Cheshire, and called to the Bar in 1627. He became of sufficient prominence in his native co. to be mayor of Congleton, and later recorder of the bor. He became prominent as a lawyer, and took part in a number of trials of importance during the period 1640 to 1647. In 1647 he was made chief justice of Chester and a Welsh judge. When Charles I was brought to trial, B. accepted the post of president of the court, putting aside all legal objections to the court, and refusing to allow Charles to speak in his own defence, and pronounced the death sentence on the king. After the execution of the king, B. became one of the prominent leaders of the Commonwealth. He was a staunch republican, and branded as illegal Cromwell's dissolution of the Rump Parliament. He was an opponent of Cromwell during the Commonwealth period, and was forced into retirement. B. was buried in Westminster Abbey, but his body was disinterred on the Restoration and publicly hanged.

Bradshaw, William (1571-1628), Puritan divine, educ. at Worcester, Ashby-de-la-Zouch Grammar School, and Cambridge. As tutor in the family of the Governor of Guernsey (c. 1595), he was influenced by Thomas Cartwright. Returning to England he preached in vills. near Cambridge. In 1601 B. became a lecturer at Chatham, but was suspended for heresy. A patron in Derbyshire helped him for a time; he was chosen lecturer at Christ Church, Newgate, 1605, but the bishop would not authorise him. In 1605 B. pub. *English Puritanisme*, supporting complete autonomy of individual congregations while advocating the duty of submission to civil authority. A Lat. version by Wm Ames (q.v.) spread these views abroad. B. got into trouble for them, and retired to Derbyshire. See *Brown's History of Congregationalism in Norfolk and Suffolk*, 1877; Gataker's life

in *Clark's Martyrology*, 1677; Neal's *History of the Puritans*, i. and ii., 1759; Barclay's *Inner Life of the Religious Societies of the Commonwealth*, 1876.

Bradstreet, Anne (c. 1612-72), Amer. poetess, b. probably at Northampton. Her father, Thomas Dudley, was steward to the Earl of Lincoln, and she was well educ., having 8 tutors as a child. She married Simon Bradstreet, an M.A. of Cambridge, in 1628, and in 1630 sailed with him to New England. In Massachusetts they lived first at Ipswich, then at N. Andover. In 1650 her vol. of poetry, *The Tenth Muse*, was pub. in London, rendering her America's first poetess. Her work is on the whole uninspired and unoriginal, though some of her later verses were more successful. See Helen Campbell, *Anne Bradstreet and Her Time*, 1890.

Bradwardine, Thomas (c. 1290-1349), Archbishop of Canterbury, known for his learning as 'Doctor Profundus.' A native of Sussex, he was educ. at Merton College, Oxford, where he rose to be doctor and prof. of divinity, and chancellor of the univ. He became famous as a lecturer and writer, especially against Pelagianism; he was also a mathematician. Having attracted royal notice, he was made chancellor of the London diocese and chaplain to Edward III, whom he accompanied during the Crécy campaign and the siege of Calais. Returning to England he was made prebendary and then archdeacon of Lincoln, and in 1349 Archbishop of Canterbury, but d. of the Black Death a few weeks later.

Brady, F. J., see AUSTRALIAN LITERATURE.

Brady, Nicholas (1659-1726), clergyman and poet, b. Bandon, Cork. Educ. at Westminster School and Oxford and Dublin Univs., he took orders, supported the Orange side in the revolution, and became chaplain successively to William III, Mary II, and Anne. From 1696 till his death he held a living at Richmond, and in 1699 he was made a D.D. of Dublin. He is best known for the metrical version of the Psalms which he made in collaboration with Nahum Tate (q.v.), and which gradually superseded the older version of Sternhold and Hopkins. B. also wrote a tragedy, *The Rape*, 1652, and some poems.

Bradycardia, abnormal slowness of the heart-beat. *Tachycardia* is the opposite.

Bradyodonts, Palaeozoic cartilaginous fishes with crushing teeth adapted for eating invertebrate shells. They were abundant in Carboniferous times, and their teeth are fairly common as fossils (e.g. *Petalodus*, *Deltodus*, *Psammodus*).

Bradypus, or AI, is the 3-toed sloth, an edentate mammal of the family Bradypodidae. It inhabits the forests of S. America. See SLOTH.

Braemar, dist. lying along the R. Dec, Aberdeenshire, Scotland, situated in the Grampians. It contains deer forests, and sev. castles and mansions, the chief being Balmoral and Abergeldie castles, and other royal residences. There are no tns: the largest vills. are Castleton

and Braemar, and Crathie. In this dist. the rebellion of 1715 broke out under the Earl of Mar.

Brag, game of cards, the interest of which depends on the ability of the player to 'brag' or bluff as to the contents of his hand. It is usually played for stakes, and is a predecessor of poker.

Braga, **Theophilo** (1843-1924), Portuguese statesman, philosopher, historian, and man of letters, and the first president of the Portuguese Rep. He was b. at Ponta Delgada (Azores) and educ. at the univ. of Coimbra, where he became head of a literary school. Later, in 1872, he was appointed prof. of literature in Lisbon. Early in life Senhor B. (whose philosophy was that of Auguste Comte, i.e., Positivist) entered politics, and by virtue of his integrity and ability became leader of the Republican party. He directed the armed rising of this party in Lisbon on 3 and 4 Oct. 1910. Being joined by the fleet in the Tagus and a portion of the garrison (led by non-commissioned officers), the rising was successful; the rep. was formally proclaimed on 5 Oct., young King Manuel fled, and the new regime was accepted by the rest of the country. B. was declared president of the provisional gov., a gov. which exercised a dictatorship for 6 months. President B.'s administration was characterised by strong anti-clerical action; the Jesuits were expelled, and clerical property was confiscated. On the adoption of a constitution and the election of a new chamber, B. retired from public life. However, after the troubles of the spring of 1915, when Arriaga resigned on May 27, B. was again called upon, and held the presidency until the election of Machado on Aug. 6. He then finally retired, and d. 28 Feb. 1924. B.'s literary output was voluminous, and includes poems, biography, and hist.—particularly literary hist. Among his better-known works are *Vision of the Ages*, 1864, *Literary Theocracies*, 1865, *The Portuguese People, Their Customs, Beliefs, and Traditions*, 1885, and *History of Portuguese Literature*, 1909-14.

Braga: 1. Dist. of NW. Portugal, in Minho prov. (q.v.). It is on the Atlantic coast, is bordered NE. by Spain, and is mainly agric. Area 1054 sq. m. Pop. 511,400.

2. (Anc. **Bracara Augusta**), city of Portugal, cap. of B. dist. It was one of the prin. tns of Lusitania (q.v.), and in the 5th cent. was the cap. of the Suevi (q.v.). It was subsequently in the hands of the Visigoths (see **GOTH**) and the Moors (730-1041). There are Rom. remains, and parts of the medieval walls still exist. There is a splendid Gothic cathedral (12th-17th cents.). The Archbishop of B. is primate of Portugal. Leather goods, hats, and cutlery are manuf. Pop. 32,650.

Bragança, or **Braganza**, **House of**. This house was founded by Alfonso, a natural son of the Portuguese King John I (q.v.), in the earlier half of the 15th cent., the title being derived from the tn of the same name (q.v.). When Portugal in 1640

threw off the Sp. yoke through a bloodless revolution, the Duke of B. became **King of Portugal** as John IV. In 1807 Napoleon declared the throne empty, and John VI retired to Brazil until 1821, being succeeded in 1826 by his son Peter, the Emperor of Brazil. Peter, however, resigned the crown in favour of his daughter Maria, with whose death in 1853 the main Portuguese branch of the house terminated.

Bragança: 1. Dist. of NE. Portugal, in Trás-os-Montes e Alto Douro prov. (q.v.). It is generally mountainous, and is enclosed on the N. and E. by Spain, and on the S. by the Douro (q.v.). Area 2526 sq. m. Pop. 227,150.

2. (Anc. **Brigantia**; Rom. **Julio-briga**), tn of Portugal, cap. of B. dist. It is the seat of a bishopric, and gave its name to the House of B. (q.v.). There is a silk industry. Pop. 8000.

3. (**Paulista**), tn in the prov. of São Paulo, Brazil, 40 m. N. of São Paulo. Textile mills and agric. products. Pop. 12,760.

Bragança, **Catherine of**, see **CATHERINE OF BRAGANZA**.

Bragança, see **BRAGANCA**.

Bragg, **Braxton** (1817-76), Amer. general, b. N. Carolina, trained in the military academy at W. Point, and served in the Seminole and Mexican wars, rising to the rank of lieutenant-colonel. From 1856 to 1861 he led a civilian life in Louisiana, where he was commissioner of public works. When the Civil war broke out in 1861 he was appointed brigadier-general, and soon after major-general, and served in the Confederate Army of the Mississippi, taking part in the battle of Shiloh, 1862. Soon after that he was placed in command of the W. Army, in succession to Gen. Beauregard, and invaded Kentucky, but was repelled by Buell. Later, he faced Rosecrans in a long and hard-fought campaign, 1862-3, in which at one time the Northerners were in great straits, but were relieved by Grant, who defeated B. at Chattanooga, Nov. 1863. The latter was now superseded, but acted as military adviser to President Davis until late in 1864, when he took part in the campaign against Sherman, which ended in the surrender of the S. Army. After the war he was appointed chief engineer to the state of Alabama. His death occurred suddenly at Galveston, Texas. See life by D. C. Seitz, 1924.

Bragg, **Sir William Henry** (1862-1942), physicist, b. Stonerise Place, Wigton, Cumberland, 2 July, son of R. J. B. He was educ. at King William College, Isle of Man; and at Trinity College, Cambridge—major scholar, 1882; third wrangler, 1884; first class in Part III of mathematical tripos, 1885. He was in Australia 1886-1908, prof. of mathematics and physics at Adelaide Univ. He was a member of the council of the S. Australian School of Mines and Industries from 1895, and of the council of the univ. from 1898. He was at Leeds Univ. as Cavendish prof., 1909-15; and then Quain prof. of physics, univ. of London, 1915-23. Elected F.R.S., 1906. With his son,

Wm Lawrence B., was awarded a Nobel prize for physics and Barnard gold medal of Columbia Univ. for work on X-rays and crystals. In 1928 he was appointed president of the Brit. Association, and from 1935 to 1940 he was president of the Royal Society; also director of the Royal Institution. K.B.E., 1920; O.M., 1931. His publs. include vols. of lectures, also papers contributed to the *Philosophical Magazine* and the *Transactions of the Royal Society*. Also, *The World of Sound*, 1920, *Concerning the Nature of Things*, 1925, and *The Universe of Light*, 1933.

Bragi, son of Odin and Freyja; Norse god of wisdom, poetry, and eloquence, named after him *bragur*. He wed Idhun, goddess of eternal youth. B. received slain heroes on their entry into Valhalla. At festivals, horns were drunk in his honour.

Braham, John (1777-1856), Eng. tenor, b. London, of Jewish family, his real name being Abraham. He first sang in public when only 10 years old. When his voice broke, he supported himself by pianoforte teaching, but after 2 years' voice training under Rauzzini at Bath, he reappeared at Drury Lane in 1796, in an opera by Storace, and many engagements were offered him. But the desire for further experience and study took him to France and Italy, where he had a long series of triumphs. Returning home in 1801, he was received with enthusiasm, and thenceforth reigned supreme in concert, oratorio, and opera. He wrote many songs, which had no great merit, but to which his singing gave wide popularity. One of them, 'The Death of Nelson,' is still known. His singing was remarkable for intense expression; Lamb (q.v.) speaks of this in one of his essays (*Imperfect Symphonies*).

Brahe, Tycho (1546-1601), Dan. astronomer, b. Knudstrup on 14 Dec., of aristocratic parentage, and educ. at the univ. of Copenhagen. He began to study the law, but his interest in astronomy was roused by the total eclipse of the sun which occurred on 21 Aug. 1560, and from that time forward he devoted himself to this science, becoming the greatest astronomer of his day. His first achievement was the radical correction of the Alphonsine and Prutenic tables (q.v.). This was while he was at Leipzig, and at Augsburg, on the evening of 11 Nov. 1572, he saw the new star in the constellation of Cassiopeia, which had been previously noticed by others but Tycho was the only one to observe it systematically and to speculate on its implications. According to Aristotelian philosophy no change could take place in the realm of the fixed stars, but now it seemed that the foundations of this philosophy were crumbling. Unable to find a parallax for the star, Tycho concluded that it could not be located in any of the lower spheres, and he announced his views about it in *De Nova Stella*, pub. in 1573. Although it was as bright as Venus when first seen, it continued to fade and by Mar. 1574 it was invisible.

This star thus brought fame to Tycho, and after further wanderings in Germany and Switzerland, King Frederick II of Denmark undertook the building, equipment, and maintenance of an observatory to enable Tycho to prosecute his astronomical labours. On the is. of Hven, or Hveen, was erected an 'astronomical castle,' called Uraniborg (city of the heavens), and an observatory was sunk in the ground named Stællborg (city of the stars). This was in 1576, and from that time till 1596 Tycho, under the protection of Frederick and his son, Christian IV, conducted a long series of painstaking observations, and enunciated the Tychoonic system of planetary motions, a system which sought to reconcile the old Ptolemaic and new Copernican systems. While here, Tycho was visited by many notable persons, including James VI of Scotland (afterwards James I of England), who wrote a poem in his honour. In 1596 B., who had ever been an object of the dislike of the majority of the members of his aristocratic caste, was deprived of his appointments and of King Christian's protection, and had to abandon his loved Uraniborg. In the summer of the next year he left Denmark with his wife and family, and at the end of 1598, in response to the pressing invitation of the Emperor Rudolph II, he estab. himself and his instruments at Benatky, near Prague in Bohemia. Here he was joined by the celebrated Kepler in Feb. 1600, and they laboured together till Tycho d., 24 Oct. 1601. Not the least among his many claims to immortality is the fact that with his observations, and acting on his advice, Kepler discovered his great laws of planetary motion. How thorough and accurate Tycho's observations were may be better appreciated when it is remembered that he d. just prior to the invention of the telescope. See also ASTRONOMY. See J. L. E. Dreyer, *Tycho Brahe: Scientific Life in the Sixteenth Century*, 1890; H. Macpherson, *Makers of Astronomy*, 1933.

Brahlov, see BRAILA.

Brahma and Brahminism. Brahma is the supreme being of the Hindu pantheon. He has 3 manifestations: Brahmā, Vishnu, and Siva, but, strictly speaking, all the other gods are merely manifestations of him, and were supposed to originate in him. Thus we read in the *Atharva-Veda*, 'All the gods are in Brahma as cows in a cow-house.' The other gods only achieved immortality when they were pervaded by him. He is, in fact, the generative power of the whole universe. His name is derived from the root *brih*, 'to expand,' and he denotes the universally diffused substance of life and created energy. Brahman (in the neuter) is simple, infinite being; when it passes into actual manifested existence it is called Brahmā; when it achieves world-growth it is termed Vishnu; and when it once more returns into simple being, Siva. All the other deities are merely manifestations of the neuter, Brahman. The fundamental doctrines of the Hindu religion gather round the Brahmin caste, and Brahminism is

practically interchangeable as a phrase with Hinduism. But the Brahmins are recognised as the highest caste in the Hindu religion—the caste of priests of the highest rank. In its ranks ceremonial purity and social exclusiveness are regarded as first essentials. Brahminism is not a body of theological dogmas, but an hereditary system of customary observances. See HINDUISM and INDIA.

Brahmanabad, ruined city N.E. of Hyderabad, Pakistan. It stood on an ancient course of the Indus, and its fortifications were 4½ m. in perimeter. Excavations suggest that everything is still *in situ*, as at Pompeii, so that probably the city was destroyed by some catastrophe which also changed the course of the river. Tradition declares that the gods destroyed it to punish the wickedness of a King Dholara, whose name occurs in the annals of 9 cents. ago.

Brahmanas, second of the 3 grand divs. of Vedic literature, being prose commentaries describing the ritual to be observed in sacrifices and worship by Brahmins. The oldest probably belong to about the 7th cent. BC. The most important are *Aitareya Brahmana*, attached to the Rigveda; *Chandogya Brahmana*, belonging to the Samaveda; and *Satapatha Brahmana*, belonging to the White Yajurveda.

Brahmaputra, riv. rising on the N. side of the Himalaya, in Tibet, about 100 m. from the source of the Indus. After flowing E. and SE. along the N. of the range for over 800 m., during which it receives many tribes, both from N. and S., it turns southward, and after a long course through almost unknown mt. ranges, during which it has a fall of 7000 ft., it emerges into Assam, India. In Tibet it is generally known as the Tsangpo, in Assam it is called the Dihang. In Assam it is joined by large tribes, and thence flows down to the Bay of Bengal. Its outlet is in delta fashion, the delta becoming mingled with the delta of the R. Ganges. It has a total length of 1800 m., and is navigable up to Dibrugarh, 800 m. from the sea.

Brahmin, or **Brahmin Ox**, see ZEBU.

Brahmins, name given to the priests who form the first of the 4 great castes among the Hindus; they are the teachers of the doctrines of the Vedas (q.v.).

Brahmo Samaj, Theistic Church in India, owes its origin to Raja Ram Mohan Roy, one of the greatest men India has produced. He was b. in 1772 in the dist. of Baidwan, and mastered at an early age the Sanskrit, Arabic, and Persian languages. Having discovered the fallacies of the religious ceremonies practised by his countrymen, he impartially investigated the Hindu Shastras, the Koran, and the Bible, repudiated the polytheistic worship of the Shastras, and inculcated the reformed principles of monotheism as found in ancient Upanishads of the Vedas. He founded a society in 1816 consisting of Hindus. Texts were read and theistic hymns were chanted, but this society died owing to the antagonism of the orthodox Hindus. In 1830 he

organised a Hindu society of prayer meetings, which may be considered as the foundation of the present B. S. The ground-work of their faith was 'the worship of the eternal and immutable Being, who is the author and preserver of the universe, but not under and by any other name, designation, or title, peculiarly used for any particular being or beings by any man or set of men whatsoever.' The basis of the new faith was the Vedas. Soon after Raja Ram Mohan Roy set sail for England, and took up residence at Bristol, where he d. in 1833. The B. S. maintained a bare existence until 1841, when Babu Debendra Nath Tagore, head of a well-known Calcutta family, devoted himself to it. He gave a printing press to the Samaj, and estab. a monthly jour. known as the *Tattvabodhini Patrika*. About 1850 a schism took place on account of the discovery that the greater part of the Vedas was polytheistic. The advanced party had nature and intuition as the groundwork of their faith. Branch societies were founded in different parts of India, especially in Bengal, and the new Church made rapid progress. Some of the articles of the B. S. creed may be tabulated as follows: (1) The book of nature and intuition supply the basis of religious faith. (2) Although the Brahmos do not consider any book written by man as the basis of their faith, yet they do accept with respect and pleasure any religious truth contained in any book. (3) The Brahmos believe that the fundamental doctrines of their religion are also the basis of every true religion. (4) They believe in the existence of one supreme Being or God—a God endowed with a distinct personality, moral attributes worthy of his nature, and an intelligence befitting the governor of the universe, and they worship him alone. They do not believe in any one of his incarnations. (5) They believe that the religious condition of man is progressive like the other departments of his condition in this world. (6) They believe in the immortality and progressive state of the soul, and declare that there is a state of conscious existence succeeding life in this world, and supplementary to it as regards the action of the universal moral gov. The B. S. has thousands of members, and considerable progress is being made. There is a fine chapel in Calcutta.

Brahms, Johannes (1833–97), Ger. composer, b. Hamburg on 7 May. He received his first music lessons from his father, a poor double-bass player, studying afterwards under Marxsen of Altona. He appeared in public as a pianist at the age of 15, but continued his studies and composition without ceasing until 1853, when he went on a concert tour with Reményi, the Hungarian violinist. During this tour he made the acquaintance of Joachim, who recognising his genius, became his friend, and gave him letters of introduction to Liszt and Schumann, who both appreciated his work, the latter proclaiming him to be 'the coming composer.' In 1857 he was made director of the court concerts and choral

society at Detmold; this appointment he held for 4 years, with plenty of leisure for study and composition. In Jan. 1859, at the Leipzig Gewandhaus, he produced his piano concerto in D minor, a work so new and opposed to convention that at first it was a failure, but, played by Clara Schumann and others, it gradually won favour throughout Germany. In 1862 B. went to Vienna, which became his permanent residence. He d. there on 3 April 1897. Though his music was thoroughly classical in spirit, yet its form and treatment were so individual and presented so many new and difficult

the most exhilarating chamber compositions in the repertory. B.'s sacred music (such as his *Requiem*) is full of restrained power, shown alike in the treatment of chorus and orchestra. Seldom passionate, B. abounds in sincere sentiment; he is often sombre, but never gloomy; he is rich in intellectual vigour, and almost always inspired. In any one of his symphonic movements all these moods are blended into a coherent artistic unity.

See M. Kalbeck, *Brahms* (Vienna), 1904; *Brahms: the Herzogenberg Correspondence* (Eng. trans.), 1909; J. A. Fuller-Maitland, *Brahms*, 1911; E. Evans, *Historical, Descriptive, and Analytical Account of the Entire Works of Johannes Brahms* (4 vols.), 1912-36; also studies by W. Murdoch, 1933, C. Geiringer, 1936, and P. Latham, 1948.

Brahui, one of the races of Baluchistan, near Pakistan. The B. are generally regarded as aboriginals, and they certainly occupied the country before the Baluchis, who have driven them into the mts, where they now live a nomadic life.

Braid, James (1795-1860), Scottish surgeon, b. Fife. His education in medicine was undertaken at Edinburgh. On the completion of his studies he practised as a surgeon in Manchester till his death. He inaugurated modern hypnotism, the word itself being introduced by him. See life by J. M. Bramwell, 1896.

Braidwood, Thomas (1715-1806), Scottish educationist; educ. Edinburgh univ. In 1760 he opened in Edinburgh a school for the deaf and dumb. It was successful, but was regarded very much as a curiosity. It was visited in 1773 by Dr Johnson. B. later came to London, where he d.

Brăila, or **Brahilov**, port of Rumania on the lower Danube; active industry and a chief outlet for Rumanian wheat. The grain wharves have a capacity of 300,000 tons, and prior to 1939 the harbour handled some 1,000,000 tons annually; there is steam communication with Constantinople. B. was captured by the Germans in 1916. In the Second World War it was captured by the Russians on 2 Sept. 1944. Pop. (1948) 96,000.

Braille, Louis (1809-52), Fr. teacher of the blind, b. Coupvray, near Paris, son of a saddler. At the age of 3 he damaged an eye with his father's awl and soon afterwards became blind. After some education at the Institut National des Jeunes Aveugles he became a prof. there. He invented the Braille system of reading by touch, using embossed dots. His system did not meet with general acceptance during his lifetime; he d. of tuberculosis at the age of 43. Dr T. R. Armitage, a blind London doctor, examined the Braille system in 1868 and worked long and successfully to estab. it for the Eng.-speaking blind. His enthusiasm led to the foundation of the National Institute for the Blind (1869) and the pub. of books and periodicals in Braille. B. pub. *Procédé pour Ecrire au Moyen des Points*, 1837. See **BLIND, Education and training**.

Braille Type, see **BLINDNESS AND THE BLIND**.



E.N.A.

JOHANNES BRAHMS

problems that he was not generally understood or appreciated for many years. He refused to write opera, and only 2 of his leading compositions were inspired from without—the *Deutsches Requiem* by the death of his mother in 1863, and the *Triumphlied* by the Ger. victories of 1870-1. Many of his works were produced in pairs having some resemblance in form and expression; this is shown especially in his 1st and 2nd, and 3rd and 4th symphonies. His numbered works amount to 122, and the collections and studies without opus number fill sev. more vols. The greatest of Ger. composers of the later 19th cent. and a firm believer in 'absolute music,' B. regarded himself as the champion of classicism. Yet in his songs, chamber music, and symphonies he is a romanticist and the true successor of Schumann. In the earlier part of his career he wrote chiefly chamber music, and his first and second quartets for strings and piano are among

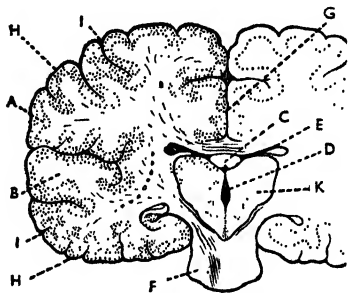
Brain, that part of the nervous system which is enclosed within the cranium and consists of the cerebrum, the cerebellum, the pons, the medulla, and the pituitary body. The average weight of the B. in man is some 50 oz. in the male and some 45 oz. in the female. It increases rapidly in weight up to the seventh year, then more slowly, and reaches a maximum between the ages of 20 and 30. The nervous system of the human body may be divided into 2 parts: (1) The sympathetic nervous system, consisting of nervous matter bound together by nervous cords and placed on either side of the vertebral column; (2) the cerebro-spinal nervous system, consisting of the B. and the spinal cord, which are continuous with each other. The systems are connected intimately with each other and together serve to co-ordinate the various parts of the body into a harmonious whole, all the functions of every part, whether exercised consciously or not, being dependent upon the proper action of the nervous system. The B. is composed of 2 substances, which are called white matter and grey matter, the former being chiefly made up of *nerve fibres* and the latter of *nerve cells*, which give rise to nerve fibre. Both kinds of matter lie in a matrix called the *neuroglia*, which therefore constitutes the supporting tissue of the B. matter. Nerve fibres are the conducting elements of the nervous system: the fibre consists of an axis-cylinder which is in many cases coated more or less thickly by a fatty substance called *myelin*. The nerve cells of the grey matter consist of protoplasmic nuclei from which certain processes proceed. The axis-cylinder process is in reality a nerve fibre, and the dendrites, or protoplasmic processes, branch out into a complexity of filaments, growing more and more attenuated as they proceed away from the nerve cell. The B. is surrounded by 3 membranes or *meninges* termed the *dura mater*, the *arachnoid mater*, and the *pia mater*. The *dura mater* is a dense fibrous membrane which adheres to the inner surface of the skull, and serves both as a feeding membrane for the bone and as an envelope for the B. The *arachnoid mater* is a thin and transparent membrane, separated from the *dura mater* by a minute quantity of fluid and from the *pia mater* by a space containing the cerebro-spinal fluid. The *pia mater* is a delicate membrane which follows the inequalities of the B. surface, dipping into all the fissures, and carrying the finer blood-vessels which proceed into the substance of the B. The B. itself, when viewed from above, presents an ovoid, or egg-like appearance. The parts then visible are the 2 cerebral hemispheres, separated by a groove from front to back called the *great longitudinal fissure*. Viewed from below, a short cylindrical portion at the rear communicates with the spinal cord. This is called the bulb or *medulla oblongata*, while above it but close to it is a white prominence called the *pons Varolii*. The closely packed mass at the rear is called the *cerebellum*. *Medulla oblongata* is the continuation

upwards of the spinal cord. It is about $1\frac{1}{2}$ in. long and 1 in. broad. At first its girth is the same as the cord; it becomes bilateral by shallow grooves anteriorly and posteriorly. As it thickens the anterior groove is crossed by bundles of nerves from each side, the formation being called the *decussation of the pyramids*. The groove is carried upwards to the pyramid, which expands up to the lower border of the pons Varolii, then becoming constricted as it disappears into the pons. Viewed from the side, the most prominent feature is the *olivary eminence*, about $\frac{1}{2}$ in. long, which marks the position of an underlying nucleus of grey matter. From behind, 2 swellings run parallel to the medial groove on each side. The inner one is called the *funiculus gracilis*, and the outer the *funiculus cuneatus*. The form ends in a prominence called the *clara*. The upper portion of the posterior area is occupied by the *restiform body*, a rope-like strand which links the medulla to the cerebellum. The medulla is composed of white matter on the surface and grey matter in the interior. The grey matter is, however, much broken up by fibres traversing it in all directions, thus constituting the *formatio reticularis*. The *pons Varolii* is a white prominence lying in front of the cerebellum. It consists of 2 parts: (1) The ventral or anterior portion, which corresponds to the pyramid of the medulla oblongata which disappears into it, and the feet of the *crura cerebri* which appear to rise out of it; (2) The dorsal portion, which represents a continuation upwards of the *formatio reticularis*. The ventral part is made up of longitudinal and transverse fibres and the dorsal portion principally of grey matter. The *cerebellum*, or little B., lies behind the pons Varolii and the medulla oblongata and below the hinder part of the cerebrum. In front and behind there are medial notches which divide the lateral hemispheres. At the bottom of the notches appear a medial lobe which is called the *vermis*. A deep horizontal fissure divides the cerebellum into an upper and a lower portion. The upper surface is divided from before backwards into the *lingula*, the central lobule, the *culmen monticuli*, the *clivus monticuli*, and the *folium caecum*. These divs. cross both hemispheres and the *vermis*. On the under surface the *vermis* is divided from behind forwards into the *tuber valvulae*, the pyramid, the *uvula*, and the *nodule*. The hemispheres are divided from behind forwards into the *postero-inferior lobule*, the *biventral lobule*, and the *tonsil* or *amygdala*. The cerebellum consists of a central mass of white matter covered by a continuous layer of grey matter. The *cerebrum*, or great B., occupies the upper portion of the skull from front to back. It is connected with the parts that lie below by the *mesencephalon*, or mid B., about $\frac{1}{2}$ in. long. It consists of a dorsal part made up of the *corpora quadrigemina*, and a ventral part composed of the *crura cerebri*, 2 rope-like strands, apparently emerging from the pons Varolii. In the interior is a canal called the *aqueduct* of

Sylvius, leading from the fourth ventricle below to the third ventricle above. The cerebrum itself is divided from the cerebellum by a membrane called the *tentorium*. A deep longitudinal fissure divides it into 2 hemispheres, which are united below by a band of white matter, the *corpus callosum*. The surface of each hemisphere consists of grey matter and exhibits convolutions or *gyri*, separated from each other by depressions or *sulci*. In each hemisphere there are 5 lobes: the frontal, parietal, occipital, temporoparietoid, and central, or is. of Reil. The grey matter on the outside, or *cortex*, extends to a thickness varying from 2.5 mm. to 6 mm. The interior is composed of white matter, but there are certain deposits of grey matter imbedded in the basal part of each hemisphere. These are called the *corpus striatum*.

Functions of the brain. The B. in man constitutes the main portion of the central nervous system, which acts, as it were, as an exchange, co-ordinating the different nervous impulses, translating the effects of a stimulus into action, and, as far as we know, into thought. Physiology has nothing to do with what the psychologists call consciousness, except indirectly. The ways in which ideas are formed, memories linked and stored, are the concern of psychology, and no satisfactory parallelism has yet been estab. between psychological phenomena and physiological facts. Sensation, however, may be trans. physically as well as psychically, and a certain amount of localisation of function in the B. has been demonstrated as regards sensation and movement. The peripheral nervous system consists of threads of nervous matter which penetrate into the remote parts of the body. Some of these nerves serve to transmit impulses from their source to some central ganglion, or nervous mass, whence impulses are again sent forth to glands and muscles, resulting in secretions and movements. The nerves which carry the impulses to the central nerve-mass are called afferent nerves, and those which carry the departing impulses, efferent nerves. The impulses carried to and from the B., particularly those in connection with the vital organs, are not related to consciousness. With respect to many nervous impulses, however, a change in consciousness does take place. The impulses which come from the stimulation of the highly differentiated systems of nerve endings in the organs of sight, hearing, touch, taste, etc., cause particular phenomena which are usually referred to under the psychological terms of sensation. The efferent nerves then carry away impulses which may have no obvious relation to the impulse from the periphery. That is to say, a highly complex process seems to have been gone through which, in the language of psychology, we call thought. Whatever may be the particular nature of the nervous movements interposed between a mass of incoming nervous impulses and the subsequent departing impulses, it is fairly certain that the seat of those movements is the complex mass of fibres and nerve cells which

we call the cortex of the fore-brain. When this portion of the B. has been removed from animals, it has been found that they have no power of co-ordinating movements. Certain stimuli may still bring about appropriate reactions, but they do so invariably and without any adjustment to other circumstances. Now there are certain actions which are performed as reflexes, such as coughing, sneezing, breathing, and the actions of the internal muscles. Many of these, however, can be brought under control if necessity arises, e.g. a cough or a sneeze may be checked. With the fore-brain removed such reflexes are not checked, but occur more regularly and certainly than under normal conditions.



VERTICAL CROSS-SECTION THROUGH THE BRAIN

A, cortex, grey matter of the cerebral hemisphere; B, white matter of the cerebral hemisphere; C, fornx; D, third ventricle; E, lateral ventricle; F, pons Varoli, cut obliquely and showing fibres running from it and forming the crura cerebri; G, median fissure; H, convolutions (gyri); I, fissures (sulci); K, optic thalamus.

Many attempts have been made to connect various portions of the cortex with appropriate differences of function. One of the most interesting was the doctrine of phrenology, which sought to connect the various areas with so-called 'faculties,' such as music, love of humanity, etc. The complex nature of such 'faculties' is sufficient to condemn the hypothesis. On the other hand, experiment and observation have enabled us to connect certain areas with stimuli arriving from the eyes, the olfactory nerves, and the ear. There are also regions which seem to be intimately connected with movements of the leg, arm, tongue, mouth, neck, and body. Electrical stimuli applied to the appropriate point in the B. have been found to produce motions in the particular parts of the body associated with them. In general, it may be remarked that knowledge of the special functions of different parts of the B. is very scanty, and that though such knowledge has been of great use in localising injuries, etc., it has

thrown no particular light on the general problem of the connection between mind and matter.

Brain diseases. These may be the result of injury or organic disease; or, on the other hand, functional disturbances, whose causes may or may not be traced to a physical source. Because of the vital nature of the B. function and its intimate connection with the function of all other organs, lesions in it are apt to be far reaching in their effects. Furthermore, since the B. is enclosed in a rigid box, any lesion, such as a growth, which tends to occupy space must do so at the expense of the space available for the B. The resulting increase in intracranial pressure may cause symptoms far more severe than those due to the lesion alone. Concussion of the B. results from a blow on the head or a fall from a height. The symptoms may range from a feeling of giddiness to complete insensibility. Vomiting accompanies a return to consciousness, and there may be subsequent disturbance of the normal functions of the B., e.g. lapses of memory. A severe blow may cause a fracture of the skull, and injury to B. tissue as well as concussion. Tumours of the B. may be benign or cancerous in their nature. The B. is of course likely to suffer if the blood stream is in any way abnormal. If the supply of blood is too small, syncope or fainting results. If one portion of the B. is cut off wholly or partially from its blood supply, as in arterio sclerosis (q.v.) or hemiplegia (q.v.), it gradually undergoes softening as a result of malnutrition. The general effect of a deficiency of oxygen is lassitude and feebleness, while too great a quantity of carbon dioxide produces drowsiness and eventually causes convulsions. Poisons find their way to the B. in the blood stream. Some of these are produced by disturbed secretions in some other part of the body, and result in auto-intoxication, a condition which reacts strongly upon the state of consciousness. Alcohol and other drugs produce characteristic mental phenomena, and the result of lead-poisoning on the B. is to lead to loss of memory and general mental feebleness. Micro-organisms may be carried to the B., causing meningitis, or inflammation of the B. substance. The B. carries on its work by the aid of nutrient matter carried by the blood, and any over-stimulation or excessive exercise of its functions without proper rest and food causes fatigue and may be the precursor of a neurosis or other state of psychological instability. For diseases of the B., see ENCEPHALITIS; EPILEPSY; GENERAL PARALYSIS OF THE INSANE; HEMIPLEGIA; HYDROCEPHALUS; MENINGITIS; POLIOMYELITIS; PSYCHIATRY; PSYCHOPATHOLOGY; SCHIZOPHRENIA. See S. W. Ranson, *Anatomy of the Nervous System* (9th ed.), 1953, and H. Gray, *Anatomy* (31st ed.), 1954.

Brain Coral (*Meandrina*), coral with meandering, sinuous grooves on the surface, which look like the convolutions of the human brain. It is circumtropical in distribution.

Braine-l'Alleud, tn in the prov. of Brabant, Belgium; manufs. glass and cotton. Wellington's extreme right was posted here at the battle of Waterloo (q.v.). Pop. 12,900.

Braine-le-Comte, tn in the prov. of Hainaut, Belgium, 20 m. SW. of Brussels. It has cotton mills, dye-works, and breweries, and specialises in the production of flax. Pop. 10,600.

Brainerd, David (1718-47), b. in Connecticut. Educ. at Yale College, he was expelled for a statement concerning the religion of one of the masters. He began his missionary duties to the Massachusetts Indians in the same year (1742). He met with the greatest success in New Jersey. He d. after the pub. of his *Mirabilia Dei inter Indicos*, and *Divine Grace Displayed*.

Brains Trust, popular name given to any group of experts who meet together for the purpose of giving information on any subject put to them or finding authoritative answers to current problems. The term 'Brain Trust' was first used to designate a group of expert advisers, chosen from academic life, who assisted President Franklin Roosevelt in his campaign for the presidential elections in 1932, and later in the formulation of the 'New Deal.' The term gained further currency as the title of a broadcast programme inaugurated by the Brit. Broadcasting Corporation on 1 Jan. 1941 with Donald McCullough as question-master. The questions were not previously made known to the B. T. and the answers were impromptu. The idea has subsequently been developed to stimulate public discussion of topics of both general and technical interest.

Brantree: 1. Mkrt tn of Essex, England, 11½ m. from Chelmsford. The church dates from the 13th cent. There are engineering works, and textile factories with manufs. of silk and *crêpe*. Pop. 17,520.

2. Tn in Norfolk co., Massachusetts, U.S.A., 10 m. SSE. of Boston. Granite is found in the neighbourhood, and there are manufs. of shoes, abrasives, petroleum and rubber products, paper boxes, and a bleaching industry. B. was the bp. of John Adams, second president of the U.S.A. Pop. 23,200.

Braising, see COOKERY.

Braithwaite, John (1797-1870), engineer. He ventilated the House of Lords by air-pumps, 1820; devised the donkey engine, 1822. He cast the statue of the Duke of Kent, which was set up in Portland Place. B. constructed the first practical steam fire-engine, and with Ericsson built for the Stephenson's locomotive engine 'Novelty,' the first to run a mile a minute, 1829. With Vignoles he projected and laid out E. Cos. railway, 1836-43. He and Ericsson fitted a canal boat with a screw propeller. This went from London to Manchester by means of canals, and back by the Thames. With Robertson he was joint founder of the *Railway Times*, 1837. He became F.S.A. in 1819; M.I.C.E. in 1838. Wrote *Supplement to Capt. Sir John Ross's*

Narrative of a Second Voyage in Search of a North-West Passage. See *Mechanic's Magazine*, xli, 1830, and *Minutes of Proceedings of Institution of Civil Engineers*, xxvi, 1871.

Braithwaite, Dame Lillian (Mrs Gerald Lawrence) (1873-1948), actress, b. Ramsgate, daughter of J. M. B., vicar of Croydon, educ. at the high schools of Croydon and Hampstead, and in Dresden. Minor parts in Benson's season at the Comedy Theatre in 1901 were followed by a tour with George Alexander, who engaged her for the St James's Theatre. There she acted in Esmond's *The Wilderness* and Stephen Phillips's *Paolo and Francesca*, establishing her reputation in W.-end comedy. In 1908 she acted with Cyril Maude in *The Flag Lieutenant* and, in 1913, with Matheson Lang in *Mr Wu*. Among her outstanding parts were those of Mrs Errol, the innocent young widowed mother, in *Little Lord Fauntleroy*, 1914, the vacillating wife in Clemence Dane's *A Bill of Divorcement* in 1921, the parasitic mother in Mr Sidney Howard's *The Silver Cord*, and one of the old sisters in the very successful play *Arsenic and Old Lace*, 1942-6. Though she occasionally returned to Shakespeare, e.g. as Portia in *The Merchant of Venice*, 1916, and as Virginia, the appealing wife of Coriolanus, most of her long succession of roles were in modern comedy, in which her dominant quality of womanly sweetness found full expression. She also acted for the cinema. D.B.E., 1943.

Brake, see BRACKEN.

Brake, Ger. port on the Weser (q.v.), in the Land of Lower Saxony (q.v.), 82 m. NW. of Hanover (q.v.). It was the chief port on the Weser until the founding of Bremerhaven (q.v.), and was the first base, in 1848, of the Ger. fleet. It has a shipbuilding industry. Pop. 17,000.

Brake, also spelled 'break'; appliance to stop or retard the motion of a body by the use of a resistance which absorbs part of the energy of the body. The need for contrivances for controlling the speed of machinery of all kinds has led to the invention of many kinds of B.s. Simpler types in common use are the block B., the slipper B., and the band B. The block B. consists of a block of wood which, on being pressed against the rim of a wheel, retards its motion. In the case of the ordinary wagon the force is applied by the foot of the driver pressing on a treadle which is connected by a system of levers to the brake-block. In the case of heavier wagons, the force is applied by means of a wheel and screw. The slipper B. is commonly used on heavy vehicles when descending hills, and consists of a metal skid or slipper into which one of the wheels fits, and is thus prevented from revolving. The increased friction retards the motion of the vehicle. The band B. is used in the case of machines such as winches and cranes, and consists of a band passing round a circular drum fixed to the shafting of the machine. On tightening the band the friction retards the motion of the machine. In the *hydraulic* B. the retarding force is the

pressure exerted by the water in a cylinder from which its escape can be regulated. This type of B. is used in elevators and other machines worked by hydraulic power. Electric B.s are now much used on electric tramway systems. When a tramway car is travelling at high speed, and the current is cut off, the momentum of the car drives the motors as dynamos and thus produces a current which is made to excite electro-magnets to which are connected metal shoes. The metal shoes becoming magnetised are attracted to the metal rails above which they are fixed, and the friction between shoe-pieces and rails retards the motion of the car. *Motor-car brakes*, see MOTOR CARS.

Railway brakes. The high speeds attained on modern railways have necessitated the construction of extremely powerful B.s.

Westinghouse brakes. It is essential that a B. for use on a modern railway train should be continuous, automatic, and quick in action; the use of such a B. is in fact enforced by law. Unless a B. can be continuously applied throughout the length of the train collisions between the rear and front carriages will occur when the latter are suddenly brought to a stop. Moreover, it is evident that a B. which can be caused to act on the wheels of each vehicle is much more powerful than one which only operates on those of the end cars. It is necessary for the B. to be automatic in order that it may at once come into action should an accident such as the uncoupling and breaking away of a coach occur. The modern Westinghouse B.s possess all these essential qualities. The 2 kinds at present in use are the air-pressure B. and the vacuum B. In both types the B.s are applied by air pressure, regulated by means of a train-pipe which runs the whole length of the train. In the case of a coach becoming accidentally uncoupled the resulting rupture of the train-pipe causes an alteration of the air pressure, which automatically causes the B.s to be applied. The original form of air-B. invented in 1869 by George Westinghouse was not automatic and has been superseded by an automatic type.

Westinghouse automatic air-brake. Invented in 1879. Compressed air is stored by means of a pump on the engine at a pressure of about 80 lb. per sq. in. This reservoir is in connection with a train-pipe. Under each vehicle is placed a small air reservoir and a triple valve which controls the admission of air to the B. cylinder. In the triple valve is a small cylinder and piston which will be caused to move by any alteration in the pressure of the air in the train-pipe. Since the movement of this piston determines the admission of air from the storage cylinder to the B. cylinder, the action of the B. is affected by variations in the pressure of the air in the train-pipe. The latter is in turn regulated by the valve in the engine cab connecting with the large reservoir of compressed air. Under normal conditions the triple valve closes the communication between the

B. cylinder and air reservoir, and hence keeps the B. out of action. To apply the B. the air pressure in the train-pipe is reduced by the driver at one end of the train or the guard at the other operating a valve. The reduction of pressure in the triple valve causes a motion of the small piston in the valve, which results in the opening of the top port. This causes some of the compressed air to enter the B. cylinder, resulting in motion of the piston which operates the B.s. When the air pressure in the auxiliary air chamber has become less than that in the train-pipe the air in the B. cylinder is automatically shut in, and the pressure of the B. shoes on the wheels is sustained. Thus the power with which the B. is applied depends upon the extent to which the pressure in the train-pipe is reduced. To release the B.s the engineer operates a valve whereby the train-pipe is again put into communication with the main reservoir of compressed air underneath the engine cab. The increased pressure in the triple valve causes a motion of the valve-piston which results in the compressed air in the B. cylinder being allowed to escape into the atmosphere. The resulting motion of the pistons releases the B., while at the same time the air from the train-pipe is enabled to pass into the auxiliary storage chamber and to recharge it ready for another application of the B.s. Now if through the accidental breaking of a coupling or some other cause one of the junctions of the train-pipe is ruptured, the air pressure within the pipe will be reduced to atmospheric pressure, the triple valve will operate as above, and the B.s will be automatically applied, bringing the coaches to a standstill. Moreover, if part of the apparatus becomes defective, resulting in a leakage of the compressed air, attention is at once called to this by the automatic application of the B. In an improved arrangement, when a large reduction is made in the air pressure in the train-pipe, the escaping air is vented straight into the B. chamber. The venting of the train-pipe under each coach is greatly accelerated, with the result that the B.-blocks are applied nearly simultaneously throughout the length of the train.

Westinghouse automatic brake improved triple valve is a valve which gives a closer approach to simultaneous action to all the triple valves in a train than most previous designs. A further improvement, also making for smooth and even action, consists of a removable plug, perforated with a series of holes always kept open, and an additional hole carrying an automatic check-valve supported by a spring. It is so arranged that when the B.s are first set, the automatic valve is opened against the spring resistance by the excess of air pressure above it, so that the larger of the open holes control the rate of flow of the air to the B. cylinder; as the air pressure on the under side of the valve increases, the spring closes the valve, when the smaller of the open holes control the rate of flow to the B. cylinder.

Vacuum brake. When this B. is in use a train-pipe exists as in the case of the air-pressure B. By means of an ejector or air-pump operated by the engine-driver, a vacuum of about 20 in. of mercury is obtained in the train-pipe and in the vacuum chambers which are fixed under each vehicle. The space in the B.-cylinder above the piston-rod is also kept a vacuum, as it is in direct communication with the vacuum chamber and train-pipe. The B. is applied by allowing air to enter the train-pipe, whereby an alteration of the pressure in the B.-cylinder results in a motion of the piston controlling the application of the B.-blocks. If through an accident a breakage of the train-pipe is caused, air at atmospheric pressure is introduced which automatically causes the application of the B.s. The maintenance of the required vacuum is essential to the working of the B. For this purpose vacuum gauges registering the difference between the pressure of the air within the vacuum chambers and that of the atmosphere are fixed inside the engine cab and the guard's van. By means of the ejector the reading is never allowed to indicate less than a certain minimum number of inches of vacuum. Passenger trains are usually operated at 20-in. vacuum, but a few railways use 24-in. vacuum, and freight trains 20-in., or 16-in. on long trains, where the high vacuum is difficult to maintain. B. cylinders are either of the combined type, with the vacuum chamber forming the outer casing of the cylinder, or separate type with an independent vacuum chamber. In the former case, the cylinder is connected to the B. pipe by a single branch valve, and in the latter case a double branch is used, the second branch connecting the vacuum space above the piston with an independent vacuum chamber.

Brakeionde, see JOCELIN DE.

Brakenbury, Sir R., see BRACKENBURY.

Brama, genus of percormorph fishes. They are large fishes, of bright colour. *B. rafi*, Raf's bream, is 1 to 2 ft long, of deep blue colour, with a large and forked tail. It is widely distributed over the warmer parts of the ocean.

Bramah, Joseph (1748-1814), inventor and engineer. He was the son of a Yorkshire farmer, but owing to an accident was unable to work on a farm. He was apprenticed to a cabinet-maker, and later started in business on his own account. His most famous invention was that of the lock which bears his name, the patent for which was taken out in 1778. Seven years later he patented the hydraulic press (q.v.). He designed a machine for the Bank of England which printed and numbered banknotes. He invented a number of other things, including machinery for the manuf. of aerated waters, and a paper-making machine. He suggested the locomotion of ships by means of screws in 1785.

Bramah Press, see HYDROSTATICS and HYDRAULIC PRESS.

Bramante, Donato (c. 1444-1514), It. architect, b. Urbino. He was apprenticed

to Fra Bartolommeo as a painter and worked in Milan from c. 1480 to 1499, when he moved to Rome. About 1482, he turned from painting to architecture. In that year he began the church of S. Satiro and in 1492-7 built the apse of S. Maria delle Grazie—both in Milan. In Rome he designed the beautiful circular 'Tempietto' adjoining the church of S. Pietro in Montorio, 1503; and the cloister of S. Maria della Pace, 1504. He also had some share in designing the Cancelleria Palace, finished in 1511. Pope Julius II employed him c. 1504 to remodel the rambling complex of buildings that formed the Vatican palace and the Belvedere, which he achieved by two long galleries enclosing a court. Owing, however, to the impatience of the Pope and B.'s zeal in trying to meet his wishes the design was not finished before the death of both the Pope and B. himself. The foundations were defective, and much of the work had to be done again. B. was also commissioned by Julius to begin the great task of rebuilding St Peter's. His designs were completed, and he worked with such celerity that before he died he had built the 4 great piers and vaulting of this portion. After his death, however, his design was considerably altered by his successors.

Bramantino (c. 1450-1536), It. painter, real name **Bartolommeo Suardi**, probably b. Milan, where he studied under Foppa of Brescia, Leonardo da Vinci, and especially under Bramante (q.v.) (hence his nickname). When the latter left Milan in 1499, B. succeeded to his position. In 1525 he was made architect and painter to Francesco Sforza II. His chief oil paintings are all sacred, the 'Holy Family' and 'Crucifixion' in the Brera Gallery and 'The Dead Christ' in the church of San Sepolcro being examples.

Brambanan, or **Prambanan**, region in Surakarta prov., Java, with many specimens of Hindu temples which are characterised by an absence of mortar in their construction. Of these edifices the most imposing is a cruciform temple whose various extensions form a square of upwards of 500 ft to the side.

Bramber, par. of Sussex, England, on the R. Adur, formerly a port. Here are the ruins of B. Castle, with the remains of a Norman gatehouse; the church of St Nicholas was built originally as a chapel to the castle and dates from about 1075. Pop. 440.

Bramble, see **BLACKBERRY**.

Brambling (*Fringilla montifringilla*), bird related to sparrows, finches, and buntings. It greatly resembles the chaffinch, but is larger, and it inhabits many parts of Europe and Asia. It is known also as the bramble finch, or mt finch.

Bramhall, John (1594-1663), Irish clergyman, educ. at Sidney-Sussex College, Cambridge. He was rapidly advanced in the Church, and in 1633 went to Ireland with Wentworth. He was imbued with the strength of mind of his master, and his Church policy in Ireland destroyed the chances of the Royalists in Protestant

Ulster. He crossed over to England on the outbreak of the Civil war, and after the death of the king took refuge on the Continent. After the Restoration he became Archbishop of Armagh.

Bramham, vil. of the W. Riding of Yorks, England, not far from Tadcaster. Near by the Percys were defeated at the battle of Bramham Moor in 1408. Pop. 1400.

Brampton, Baron, see **HAWKINS**, SIR H.

Brampton: 1. Anc't mkt tn in Cumberland, England, 9 m. ENE. of Carlisle. The remains of an Early Eng. church contain an interesting crypt. It is a rural centre, and has a sheet-metal industry. Pop. 3000.

2. Co. tn of Peel co., Ontario, Canada, an important railway junction 20 m. NW. of Toronto. It is particularly noted for its horticult. nurseries and greenhouses. Pop. 11,165.

Bramwell, Sir **Byrom** (1847-1931), physician, b. N. Shields, son of a physician, educ. at Cheltenham College, Edinburgh, and Paris. He qualified in 1869, M.D. 1877. He assisted his father in practice at N. Shields and in 1872 was appointed lecturer in medical jurisprudence at Durham College of Medicine, Newcastle. He began to practise as a consultant in Newcastle in 1874 but moved to Edinburgh in 1879. He was appointed pathologist to Edinburgh Royal Infirmary in 1882, assistant physician in 1885, and physician in 1897. B. made his scientific reputation in the fields of neurology, diseases of the cardiovascular system and the blood, and in endocrinology. He was president of the Royal College of Physicians of Edinburgh in 1910. He was a versatile sportsman, a man of tireless energy and strong physique. He was knighted in 1924. He wrote *Diseases of the Spinal Cord*, 1882, *Diseases of the Heart and Thoracic Aorta*, 1884, *Intra-cranial Tumours*, 1888, *Anaemia and Diseases of the Blood-Forming Organs*, 1899, *Atlas of Clinical Medicine* (3 vols.), 1892-6, and *Clinical Studies* (8 vols.), 1902-10.

Bramwell, Sir **Frederick** (1818-1903), engineer. He set up for himself in 1853 as a consulting engineer. As an advocate and expert witness in the law courts and parl. committee rooms he was unsurpassed, and his services as adviser and arbitrator were in constant request. He took a leading part in many scientific societies, and was chairman of the City and Guilds Institute, and of the Inventions Exhibition, 1885. He was on the council of the Royal Society, and in 1888 president of the Brit. Association.

Bramwell, George William Wilshire, Baron (1808-92), judge, b. London. He became a barrister in 1838, and went on the home circuit. Q.C., 1851; knighted in 1856; judge, 1876. At his suggestion the word 'limited' was added to the titles of companies that want to limit their liability. He was partly responsible for the Companies Act, 1862. Granted title Baron B., 1882. Sound law, common sense, and clear expression marked his judgments. See *Fairfield's life*, 1898.

Bramwell, John Milne (1852-1925), physician, b. Perth, educ. at Perth and Edinburgh Univ. (M.B., 1873). After a year's travel he practised for some time at Goole, Yorks. Became noted after 1889 for his pubs. on hypnotism, and his treatment by suggestion. Among his works are *James Braid, Surgeon and Hypnotist*; *Hypnotism in the Treatment of Insanity and Allied Disorders*; *Hypnotic Anaesthesia*; *Dipsomania and its Treatment—by Suggestion*; *Hypnotism and Treatment by Suggestion*.

Bran, Celtic mythological figure, often alluded to as the Blessed, son of Llyr. His sphere was that of the poetical and musical arts, and he was represented as being of gigantic height. In later times he was regarded as a saint who had brought the cross from Rome to Britain, and is an instance of how the early Church was successful in metamorphosing heathen deities into 'saints.' Hence his title of the Blessed. An ancient Welsh poem states that his head was buried under the White Tower of London, the eyes looking towards France, as a spell against foreign invasion, but Arthur disclaimed to take advantage of magic in guarding his kingdom, and had the head exhumed.

Bran, husk of wheat and other grain. In bread manuf. the B. is separated from the fine flour, while in the preparation of brown bread it is included as an ingredient. Its composition of water 13 per cent, protein equivalent 9.9, and starch equivalent 42.6, gives it some nutritive value in addition to which it has a valuable laxative effect. It is also used in making cattle foods, and in cleaning goods in dyeing works.

Brancaster, fishing vil. and par. of Norfolk, England; near by is Scott Head, a range of sand dunes forming a bird sanctuary belonging to the National Trust. Pop. 1000.

Branchiae, see GILLS.

Branchidae, priestly family of Asia Minor, claiming descent from Branchus, son of Apollo, guardians of Apollo's temple and oracle at Didyma, near Miletus. The Brit. Museum contains seated statues that once bordered a sacred way to the temple. See Herodotus, i. 157, vi. 19.

Branchiopoda (Gk *brachia*, gills; *pous*, foot), a group of crustacea with sev. pairs of limbs which are leaf-like or lobed in form, so that the order is also known as Phyllopoda (Gk *phyllon*, a leaf). They are usually to be found in fresh water, and never in the sea, though occasionally they inhabit salt lakes (e.g. *Artemia*, the brine shrimp). The best-known member is *Daphnia*, the fresh-water flea, belonging to the sub-group Cladocera.

Branchiostoma, name given by Costa in 1834 to a curious creature he found on the Neapolitan shore. Two years later it was rediscovered by Yarrell, described in his *History of British Fishes*, and is now known by the name he gave it of *Amphioxus* (q.v.).

Brancker, Sir William Sefton (1877-1930), Eng. soldier and military aeronautical officer. Son of Col. W. G.

Brancker, Royal Artillery. Educ. at Bedford and the Royal Military Academy, Woolwich. Began army career as a lieutenant in the Royal Artillery in 1896 and served in the S. African war (1902). Trained in aviation 4 years before the First World War, on the outbreak of which he was appointed deputy director of military aeronautics. Carried out a flight to India during the First World War. In 1918 he was appointed controller-general of equipment and director of personnel on the Air Council; later director of civil aviation in the Air Ministry and undertook many flights on official missions. Killed in disaster to *Leiot*, Oct. 1930. See life by N. Macmillan, 1935.

Brancovan, Constantin (1654-1714), Rumanian noble of the family of B., or Brancoveanu, which originally came from Serbia. He became Prince of Wallachia in 1688 after assisting Turkey in the Austrian war of 1690. Thereafter he managed by astute diplomacy to remain neutral and to maintain his own position, until, clearly compromised in his dealings with Russia, he was deposed and beheaded by the Turks, 1714. His death has been made the subject of numerous Rumanian popular ballads. With his encouragement Wallachia became during his reign a printing centre for the Orthodox E.

Brancovich, George, see BRANKOVICH.

Brancusi, Constantin (1876-1957), Rumanian sculptor, who studied at Cracow and Bucharest, and had guidance from Rodin (q.v.) in Paris. He is noted for his simplification of bird and fish forms, and as the pioneer, since 1907, of abstract sculpture.

Brand, Henry Bouverie William (1814-1892), 1st Viscount Hampden and 23rd Baron Dacre, politician, educ. Eton. He became private secretary to Sir George Grey in 1846, and entered Parliament in 1852 as Liberal member for Lewes. In 1872 he was elected Speaker without opposition, and re-elected in 1874 and 1880. The most remarkable event in his speakership was when, on 2 Feb. 1881, he closed the debate on the Coercion Bill, on his own authority, after a 41-hr sitting. He was raised to the peerage in 1884.

Brand, Sir Jan Hendrik (1823-38), S. African politician, b. Cape Town, son of Sir H. C. B., speaker of the Cape House of Assembly. He entered the law. In 1863 he became president of the Orange Free State, and was 4 times re-elected: in 1869, 1874, 1879, and 1886. In 1876 he visited England to attend the conference to discuss the estab. of a S. African Confederation. B. opposed the scheme, which failed. At the beginning of the war between the Transvaal and Great Britain in 1880, B. preserved a neutral position, and acted as one of the mediators at the peace conference in 1881.

Brand, John (1744-1806), antiquary, b. Durham. He received his education at the local grammar school, after which he was sent to Oxford by the aid of friends. He took holy orders there and became rector of 2 pars. in the city of

ought to owe all their colour and half their taste to the wood. In Armagnac they are stored in casks of the native black oak in which they mature far more quickly than Cognac. In Cognac the blending of *eaux-de-vie* of various years from various dists. within the region is a fine art, and it is becoming more and more difficult to find that perfection of Cognac, distilled from the wines of a single outstanding year grown in the very heart of the region, which has a right to the name Champagne. In Armagnac, on the other hand, the proprietor of each vineyard makes his own B., for there is little big business and there is a wonderful variety of really fine B. to be found. Armagnac gains colour from its black oak so quickly and its flavour is so rich that it needs neither sweetening nor colouring matter. Most blended Cognacs are coloured and sweetened by minute doses of caramel which obscure their bouquet and flavour. Napoleon B.s are patent frauds, since they profess to have been bottled in the time of the emperor and the spirit merely goes down-hill without improving in a bottle. See A. Baudouin, *Les Eaux-de-vie et la fabrication du Cognac*, 1893; H. Warner Allen, *White Wines and Cognac* (with a notice of Armagnac), 1952, and *Through the Wineglass*, 1954.

Brandywine Creek, stream rising in Chester co., Pennsylvania. It flows into the Delaware R., and finally empties itself into Christina R. at Wilmington. A battle was fought on its banks during the Amer. War of Independence in 1777.

Brangwyn, Sir Frank (1867-1956), painter, b. Bruges. He worked under Wm Morris at 15, then went to sea. His frequent travels in the E. greatly influenced his artistic development. Rich colouring and well-balanced design mark his decorative panels and frescoes for the Royal Exchange, Lloyd's Registry, Skinners' Hall, and the chapel of Christ's Hospital School. Italy, Germany, America, and Australia also possess specimens of his work. B. also made designs for book decoration, pottery, tapestry, and furniture, and many etchings and water-colours. He became A.R.A. in 1904. In 1925 the nation received an offer from Lord Iveagh of £20,000 for the decoration of the royal gallery in the House of Lords by a series of paintings by B. B. began painting a number of great panels, 5 of which were placed in the gallery; but in 1930 the House of Lords decided by 55 votes to 11 to reject the panels, apparently on the ground that the paintings, though highly meritorious, were not in keeping with the restrained dignity of the gallery. They are now in the Guildhall, Swansea. Awarded the gold medal of the Berlin Academy in 1912. President of the Royal Society of Brit. Artists from 1913 to 1918. Elected R.A. in 1919. Member of the Legion of Honour. Awarded the Albert Medal of the Royal Society of Arts, 1932. Knighted, 1941. The works of this world-famous artist are widely distributed and there is a B. Museum at Bruges. A comprehensive exhibition of his work was held at the Royal Academy

in 1952. Pubs.: *Belgium*, 1916, and *The Way of the Cross*, 1935. See W. De Belleruche, *Brangwyn's Pilgrimage: Life Story of an Artist*, 1948.

Branlewo (Ger. Braunsberg), tn of Poland, in Olstzyn prov., 61 m. NNW. of Olstzyn (q.v.). It is on the R. Pasleka, 4½ m. from its mouth on the Vistula lagoon (q.v.). B., which was the chief tn of Ermeland (q.v.), was a stronghold of the Teutonic Knights (q.v.) in the 13th cent. In 1466 it was taken by the Poles, and in 1772 it went to Prussia. During the Second World War it was very severely damaged, and before being again made part of Poland in 1945 was evacuated by its Ger. pop. Pop. 2800 (1939, 21,142).

Brankovich, George (c. 1367-1457), Prince of Serbia from 1427, when he succeeded his uncle, Stephen the Tall. He was driven into Hungary by Sultan Murad II in 1437. After a period of exile, he organised an expedition against the Turks, under himself, the Hungarian, Janos Hunyadi, and Wladislas of Poland. Murad asked for a 10-year truce, offering excellent terms, which were accepted. But on receiving news that a Venetian fleet was about to attack Murad, the allies broke their agreement and marched S. B., fearing Muslim vengeance, sent secret intelligence to Murad, and also dissuaded Albania from joining the league. Murad consequently won the battle of Varna (Nov. 1444), Wladislas being killed and Hunyadi narrowly escaping. B. was allowed to keep his principality.

Branks, scolding-bridle. It was an instrument consisting of an iron hoop with hinges at the sides and fashioned to enclose the head. An arrangement in front rendered speech impossible; in some cases a knife was used, so that the slightest movement caused great pain. Any woman guilty of a petty breach of the peace was formerly marched through the streets by the bridle with the B. upon her head, making herself a subject for the insults and jeers of the populace.

Branksea, see BROWNSEA.

Branksome, part of the bor. of Poole (q.v.), Dorset.

Brankursine, see ACANTHUS.

Branly, Edouard (1844-1940), Fr. physicist, inventor of the coherer (q.v.), used as detector in early experiments on electromagnetic waves.

Brant, Joseph (1742-1807), chief of the Mohawk Indians. He assisted the Brit. during the Indian and revolutionary wars. His energies were quite as indefatigably exerted on behalf of peace in later years. He became a zealous Christian in his later life, and trans. the Book of Common Prayer and part of the Bible into Mohawk. He visited England for the purpose of raising money on behalf of the erection of the first episcopal church in Canada in 1786. A monument is erected to his memory at Brantford, Ontario.

Brant, or Brandt, Sebastian (1458-1521), Ger. poet and satirist, b. Strasburg. He studied at the univ. of Basel, where he distinguished himself afterwards becoming a prof. there. He returned to

Strasbourg to practise law in that tn. and was honoured by the Emperor Maximilian, being made count palatine. Among his writings are Lat. poems and treatises on law. But his best-known book is *Das Narrenschiff* (The Ship of Fools), pub. in 1494, written in rhymed couplets, with 110 foils representing the follies of the age. Although devoid of artistic beauty of structure, and though the satire is often coarse, the work appealed to popular taste. It is supposed to have given Erasmus the idea for his *Praise of Folly*. The *Narrenschiff* has been trans. into most European languages. Alexander Barclay's *Shippe of Fools*, 1509, is a free trans. in verse; and an abridged prose trans. was pub. by Henry Watson in 1517. See Rajewski, *Sebastian Brant*, 1944.

Brantford, cap. of Brant co., Ontario, Canada, 24 m. W. of Hamilton and 30 m. N. of Port Dover harbour on Lake Erie. It is the site of His Majesty's Chapel of the Mohawks, the first church built in Ontario. The city has a collegiate institute and vocational school and many primary or public schools, a well-equipped general hospital, 51 churches, a fine public library, 4 parks. Here is the Prov. School for the Blind. The chief industries are agric. machinery and implements, textiles, binder twine, tanning and wood-pulp machinery. B. is the centre of a very rich agric. dist. It is on both the Canadian National and Canadian Pacific railways and has a modern airport. Its residential dists. along the Grand R. are the largest in S. Ontario. B. has developed from land given by the Six Nations Indians in 1830 from the 'reserve' given to their leader, Joseph Brant (q.v.), in 1784 by the Brit. Gov. to recompense them for their homes abandoned in the Mohawk Valley, New York State, during the Amer. Revolution. Sometimes called 'the telephone city,' from the fact that it was here that Dr A. G. Bell invented the telephone in 1874. Pop. 49,856.

Branting, Karl Hjalmar (1860-1925), Swedish statesman, b. Stockholm, and educ. at Upsala (Uppsala) Univ. He helped to found the Social Democratic party, 1889, and was its leader from 1907. He was the first Social Democrat to be elected to the second chamber, 1896. B. was finance minister in the Liberal-Labour coalition, 1917; first became Premier, 1920; again from 1921 till 1923; and from 1924 till 25 Jan. 1926. He was a strong supporter of the League of Nations, being elected to its council in 1922, and being Swedish delegate to the Paris conference for settlement of Åland and Spitzbergen questions. He received a Nobel peace prize, 1921.

Brantôme, Pierre de Bourdelle, Seigneur de (c. 1540-1614), Fr. soldier and memoir writer, b. Périgord, educ. at Paris and Poitiers. He was given sev. benefices. He had, however, no inclination to enter the Church, and chose arms as his profession. He gained a great reputation as a soldier during the religious wars in France. He travelled extensively, visiting Scotland, England, Spain, Portugal,

and Morocco. Later he served at court under Charles IX and Henry III. About 1595 he went into retirement, and devoted himself to writing. As a historian he is not entirely trustworthy, but his *Mémoires de Hommes illustres* and *Dames galantes* have a fascinating style of their own, and he draws a vivid picture of the profligacy and gallantries of the court life of the period. His *Mémoires* were first pub. in 9 vols., 1665-6.

Brantôme, Fr. tn in the dept of Dordogne, on an is. formed by 2 branches of the Dronne. There are a splendid Romanesque bell-tower, and the remains of an abbey founded by Charlemagne. Pop. 2200.

Braque, Georges (1881-), Fr. painter, b. Argenteuil. His father was a contractor for house-painting, and B. in his boyhood observed his father's workmen mixing colours, and especially noted the processes of 'graining' and 'marbling.' He went to Paris to study art in 1904 and painted in the 'Fauve' manner, with bright, free colour, until about 1908 when the Cubist movement came into being. B. was a friend of Picasso, who is commonly credited with having invented Cubism, but it seems that B. was the first to exhibit a Cubist picture—at the Salon des Indépendants in 1908. The idea behind Cubism led logically to abstraction, a path that B. has pursued without losing a sense of pictorial beauty. B. aimed at producing a new sort of unity, a lyricism which issues wholly from the means employed, and his respect for his material and, in his own words, for the 'Rule which corrects the Emotion' is obvious. In his many still-lives he shows how from some quite simple object, such as a dish of fruit, a whole set of novel relationships and harmonies can be derived. The Brit. Council paid him tribute with a large exhibition at the Tate Gallery, 1946, and this was impressively supplemented by the Arts Council exhibition of 1956. See Maoght, *Cahiers de Georges Braque*, 1917-47, 1948; also studies by J. Paulhan, 1946, B. Dorival, 1948, and A. Verdet, 1956.

Bras d'Or, Lake, gulf belonging to the Atlantic Ocean, which very nearly divides Cape Breton Is. into 2 parts. It is irregular in shape, and the isthmus in the S., which joins the 2 pieces, is just a little more than 1 m. in breadth.

Brasenose College, Oxford, founded by Wm Smyth, Bishop of Lincoln, and Sir Richard Sutton of Prestbury, Cheshire, in 1509. The main front, facing Radcliffe Square and the first quadrangle, except the upper storey, date from the foundation. In the chapel, 1683-6, the Gothic and Grecian styles are combined. The hall dates from the early 16th cent. As early as the 13th cent. a B. Hall existed, and in 1333 some students migrated to a house in Stamford, known as B. Hall, finding the factions in Oxford a hindrance to learning. An ancient knocker in the shape of a nose, which was brought in 1890 from this house to the hall in Oxford, may well be the origin of the name.

Brasidas (d. 422 BC.), Spartan general during the first decade of the Peloponnesian war. He first distinguished himself by the relief of Methone (431). In 428 he led a force of helots and mercenaries into Thessaly with a view to destroying the Athenian empire in the N., and won over sev. Athenian colonies in that region. In April 422, on the conclusion of a truce between Athens and Sparta, B. defeated the Athenian army at Amphipolis but was himself mortally wounded. His death, and that of the Athenian general, Cleon (q.v.), prepared the way for the Peace of Nicias in the following year. See Thucydides, II-v.

Brasília, cap.-designate of Brazil, in Goyaz state, situated on a plateau 3500 ft above sea level, more than 1000 m. from the sea, and set amidst magnificent scenery. The new city has been carefully planned on the most modern lines for a pop. of 500,000; in 1957 the pop. was about 4000.

Brasov, see STALIN (tn).

Brass, tn on the mouth of the B. estuary, in the Niger delta, S. Nigeria, said to be named from the brass rods exchanged by early traders for oil and slaves.

Brass, metal composed of copper and zinc. It has been known from very early times; it is mentioned in an old Scripture hist. as being manuf. into instruments of music, ornaments, and various other things. In all probability these were not made from B., but from bronze, since we have no clue to the composition of the metal. The Romans used an alloy which they called *aurechalum*, and this seems to have been B. Monumental B.s are the earliest traces of the use of the metal in Great Britain. In the reign of Henry VIII, the export of B. was forbidden, a fact which indicates that the manuf. of B. was extensively carried on in England. The former method of manuf. was that of mixing with powdered zinc ore small quantities of copper. The mixture then was heated in large pots over a furnace. The modern process is that of mixing metallic zinc with copper, in crucibles, or in a reverberatory furnace, the copper being first reduced to a molten state, and then the zinc added, also in a melting state. When crucibles are used, there is less waste. The molten metal is then poured from the crucibles into moulds to form ingots for remelting. The B. trade in England is carried on chiefly at Birmingham. The various processes are casting, rolling, and drawing, stamping, tube-drawing, and casing, and B. finishing. B. wire is used in immense quantities for the manuf. of pins, papermaker's wire web, shoe rivets, etc. B. finishing includes dipping, burnishing, lacquering, etc. When an article in B. is made, it goes through a cleansing process in acid, and then it is dipped into a solution of nitric acid. For the process of burnishing, polished steel tools are used, and the article is washed in a weak solution of acid, after which it is dried in sawdust. When lacquering is done the work is heated, and while in this state

a coating of varnish, made of shellac dissolved in spirit, is spread over the surface of the article.

Brasses, Monumental, see MONUMENTAL BRASSES.

Brassey, Thomas (1805-70), railway contractor. B. near Chester, he was educ. at the local school. He began life as a surveyor, and thus acquired the outlook and experience necessary to the calling he subsequently adopted. He was in business in Birkenhead. There he undertook a contract for railway work, and in a few years was at the head of a great undertaking which carried out contracts in all parts of the world. Among his chief contracts were the Great N. railway, 1847-51, and railways in Franco, Italy, Canada, Australia, and India.

Brassey, Thomas, 1st Earl (1836-1919), eldest son of Thomas B. (q.v.), politician, b. Stafford, and educ. at Rugby and Univ. College, Oxford. He became a Liberal M.P. in 1865. He devoted himself particularly to naval questions, and is known as the founder of *The Naval Annual*. He filled the position of civil lord of the Admiralty from 1880 to 1884, and in 1884-5 was secretary. He was Governor of Victoria, 1895-1900. Knighted, 1880; baron, 1886; earl, 1911. His publs. include *British Scamen*, 1877, and *The British Navy* (5 vols), 1882-3.

Brassica, family Cruciferae, genus of 30 species or more, chiefly ann. or biennial herbs, native to Mediterranean or Europe; and many cultivated as food plants. *B. oleracea* is the cabbage, and derived from it are its vars.—*acephala*, Kale; *bullata*, Savoys; *gemmifera*, Brussel Sprouts; *capitata*, Red and White Cabbages; *gongylodes*, Kohlrabi; *botrytis*, Sprouting Broccoli; and *cauliflora*, Cauliflower. *B. campestris* var. *rapa* is the Turnip; *B. cernua*, Petsai Cabbage; *B. napus*, Rape; and *B. nigra*, Black Mustard.

Brassó, see STALIN (tn).

Brassy, see BIR.

Brathwaite, Richard (c. 1588-1673), Brit. poet. He entered Oxford Univ. at the age of 16, passing thence to Cambridge. He settled later in London. He produced *The Golden Fleece* in 1611, a collection of poems. This was followed in 1614 by *The Poet's Willow* (pastorals), *The Prodigal's Tears* (moral treatise), and *The Schollers Medley* (historical survey). In the following year he brought out *A Strappado for the Devil*, which followed the style of the *Abuses Stript and Whipt* of George Wither. *Barnabee's Journal*, 1638, is the only noteworthy work among his many publs. See M. W. Black, *Richard Brathwaite*, 1928.

Brătianu, Ion Constantin (1821-91), Rumanian statesman. From 1841 to 1848 he studied in Paris, where he associated with advanced Liberals and brought back their ideals with him to Wallachia. In 1848 he took part in the Rumanian rebellion, and was prefect of police at Bucharest under the provisional republican gov. When the rising was crushed he escaped to Paris. In 1857 he returned home and took his place thenceforward as

one of the Liberal leaders. He had much to do with the election of Prince Charles of Hohenzollern-Sigmaringen to the throne of Rumania in 1866, and was one of the ministry up to 1870. After the dissolution he was implicated in a conspiracy against the prince but was acquitted. In 1876 he became Premier, and was thus head of affairs during the war of 1877, in which Rumania, with the help of Russia, achieved her independence. His premiership lasted until 1888, and was marked by reforms, especially in education and commercial affairs. Besides being a statesman, B. also attained distinction as a political writer.

Brătianu, Ionel (Ion) (1864-1927), Rumanian politician, son of Ion Constantin B. (q.v.). Leader of the Rumanian Liberals, he was a zealous supporter of the Entente cause in the First World War. He concluded with the Entente powers a treaty on the basis of which Rumania declared war on Germany and Austria. During the war and almost to the year of his death, B. was Premier and, virtually, dictator of Rumania. Was one of the Rumanian delegates to the inter-allied peace conference in Paris in 1919. He was in opposition 1919-21.

Bratislava: 1. Region (*kraj*) in central Czechoslovakia, bordering on Austria and Hungary, part of the former prov. of Slovakia (q.v.). It contains a long ridge of the Carpathians (q.v.), but is generally low-lying and fertile and is watered by the Danube (q.v.). Area 2900 sq. m.; pop. 838,500.

2. (Ger. *Pressburg*; Magyar *Pozsony*). Czechoslovak city, cap. of the region of B. and former cap. of the prov. of Slovakia, on the Danube. It is near the point at which Czechoslovakia, Austria, and Hungary meet. It was once cap. of Hungary (1541-1784), having belonged to that country since the 10th cent., and sev. Hungarian kings were crowned in its cathedral (partly 13th cent.). Other noteworthy buildings are the Franciscan church (1290), the town hall (1288), and the Landhaus where the Hungarian representatives met until 1848. A Hungarian univ. was founded here in 1465; this has been removed to Pécs (q.v.) and in its place is a Slovak univ. (1919). There is also a technical univ. (1938). B. is an important riv. port and railway centre. It has textile, engineering, chemical, and petroleum-refining industries, and has a trade in agric. produce and wine. Pop. 184,500.

Bratsberg, mountainous dist. in the S. part of Norway; former name of Telemark (q.v.) co.

Bratsk, tn in Irkutsk Oblast of S. Siberia, on R. Angara and Tayshet-Lena railway, founded 1831 as a fort. Since 1955 it has been the building site of B. hydro-electric station, the largest in the world (3,200,000 kw.), and the prospective centre of a new major industrial area.

Bratstvo (Russian *brotherhood*), name of Russian Orthodox organisations which existed in the tns of the Ukraine and Belorussia in the 16th-18th cents. when

these tns. belonged to the Polish-Lithuanian state. A B., organised on the lines of a guild and attached to a church, had religious and charitable functions. Later the main function was resistance to the Catholic and Polishising influences. B.s set up printing presses and founded schools, some of which attained a high degree of scholarship. The most famous B.s were those of Lvov and Kiev.

Brattice, framework of boards, iron plates, or brickwork, built transversely in the galleries of mines, to regulate the flow of ventilation. In cases of emergency, sheets of heavy canvas, called H. cloths, impregnated with a creosote preparation, are sometimes used.

Brattleboro, vll. of Windham co., Vermont, U.S.A. Its industries comprise the manuf. of organs, textiles, optical goods, wood products, paint, flour, and feed, while a large portion of the inhab. are engaged in sugar refining, farming, and dairying. Pop. 11,522.

Brauchitsch, Walther Heinrich Alfred Hermann von (1881-1948), Ger. soldier, b. Berlin. He served in the artillery and rose to rank of captain during the First World War. He became a major-general in 1931, and a chief of artillery in 1932. Under the Nazis his rise was rapid, and in 1938 he was made Commander-in-Chief of the Ger. Army, and a field marshal. He carried out the occupation of Austria and Czechoslovakia, and was instrumental in building the Siegfried wall. On the outbreak of the Second World War, B.'s long-formulated plans for the conquest of Poland were carried out by *blitzkrieg* methods, and he was responsible for the general conduct of the war until relieved of his command by Hitler in Dec. 1941.

Braun, Eva (d. 1945), mistress and wife of Adolf Hitler (q.v.). After an association lasting sev. years Hitler is believed to have married B. on or about 29 April 1945, in the Berlin bunker where they subsequently committed suicide, 30 April 1945.

Braun, Karl Ferdinand (1850-1918), Austrian physicist, b. Fulda; educ. at Fulda Gymnasium, and Marburg and Berlin univs. In 1872 he graduated with a work on the vibration of chords. He was successively prof. at Marburg, Strassburg, Karlsruhe, and Tübingen, directing the building of the Physical Institute there. In 1895 he became prof. of physics at Strassburg Univ., and director of the Physical Institute. His best-known researches are the so-called 'B.'s cathode-ray tube' and the wave circuit. The wave circuit is the basis of all arrangements for wireless telegraphy, which he improved by inventing a method allowing the sender's energy to be increased at will, and by another by which dispatches can be sent in a particular direction. His calculation of the constant of gravitation, by the torsion balance method, agrees closely with that of Prof. Boys. He and Hartmann constructed an apparatus for measuring the intensity of the magnetic field by a fine bismuth wire. B. showed the identity of electric waves and light. His latest

works were on demonstrating metallic gratings so fine as not to be within the microscope's range. In 1901 his *Drahtlose Telegraphie durch Wasser und Luft* appeared at Leipzig. In 1909 he and Marconi jointly won the Nobel prize for physics.

Braunau, see BROUMOV.

Braunau-am-Inn, Austrian tn in the prov. of Upper Austria, on the Bavarian border. It has 3 Gothic churches and some fine old houses. Hitler (q.v.) was b. here. Near by is an important aluminium mine. Pop. 12,000.

Brauner, Bohuslav (1855-1935), Czech chemist, b. Prague. He studied chem. under Bunsen and, in England, under Roscoe. He was a leading authority on inorganic chem. and conducted valuable research work on atomic weights (e.g. tellurium, 1889) and on the rare earths. Among his publs. are *Fluorescence*, 1877, *Atomic Weight of Beryllium*, 1878, *Chemistry of the Rare Earths*, 1882, *Experimental Studies in the Periodic Law*, 1889, and *Observations on Argon*, 1895.

Braunite, tetragonal mineral, occurring as small brown or black octahedra and compact masses in manganese deposits as Mn_2O_3 . It is found in large quantities and mined as an ore of manganese in the Central Provinces of India.

Braunsberg, see BRANIEWO.

Braunschweig, see BRUNSWICK.

Brauer, or **Brouwer**, Adriaen (1605-1638), Dutch painter, b., according to some biographers, at Haarlem, and according to others at Oudenarde. He worked both at Haarlem (with Frans Hals) and at Antwerp where he d. It is believed he led a dissolute life but his brilliant tavern scenes were highly appreciated by Rubens and Rembrandt (qq.v.). Rubens (who had 17 of his works) gave him a decent burial. Among his pictures are 'A Quarrel between Two Peasants' (at Dresden) and 'Spanish Soldiers playing at Dice' (at Munich)—most of them, indeed, being a reflection of the life he knew. See H. Talbot, *Laughter from the Lowlands*, 1936.

Brava, small is. in Cape Verde archipelago, Africa. Healthy, mountainous, and fertile inland. Harbour, Furnas. Pop. 7000.

Bravoes, It. bandits, outlaws, and assassins, who offered their services for money. They were originally retainers of noble It. families, and fought for their cause, but degenerated into ruffians who would do anything for money.

Bravura, It. term applied in music to a composition, and sometimes to a style of performance. Music of the B. type is characterised by a vigorous motif with many difficult and florid passages. A B. air demands skill and spirit in its execution, each syllable being divided into sev. 'notes.' It connotes 'skill': e.g. *Aria di bravura*, a brilliant aria making great demands on the singer. Mozart excelled in this style, largely through his mastery of instrumentation.

Brawling by clergy or laity in a church or churchyard was an offence created by the B. Act, 1551, to punish the B. scenes

common in the early days of the Reformation. Under the Eccles. Courts Jurisdiction Act, 1860, the offence committed by either clergy or laity is punishable at petty sessions (q.v.) by fine or imprisonment.

Brawn, food made with pig's head. The head is thoroughly cleaned and boiled. After that all the bones are removed, and the whole is chopped into small pieces. It is set by means of the liquor in which it has been boiled and can be placed in moulds.

Braxfield, Robert Macqueen, Lord (1722-99), Scottish judge, admitted advocate in 1744, and acted as counsel for the Crown in many difficult feudal cases after 'the '45.' Made a Lord of session in 1776 with the title of Lord B., he became Lord Justice-clerk in 1788, and in the session trials of 1793-4 earned the name of 'the Joffreys of Scotland.' He is delineated in Stevenson's *Weir of Hermiston*.

Braxy, see SHEEP.

Bray, Anna Eliza, née Kempe (1790-1883), authoress, b. London. Among her many works, comprising romance and travel, are *The Borders of the Tamar and Tavy*, 1836, *Life of Thomas Stothard, R.A.*, 1851, and *A Peep at the Pixies*, 1856.

Bray, Thomas (1856-1730), divine and philanthropist, b. in Shropshire. After being educ. at Oswestry school, he went to All Souls' College, Oxford. His graduation took place there in 1678. He obtained the rectory of Sheldon in 1690, where he wrote a portion of his *Catechetical Lectures*. These lectures earned for him a wide reputation. His energies were now directed towards the institution of public libraries in England and America. Phenomenal success attended his efforts, no fewer than 80 in England and 36 in America being constructed before his death. The Society for Promoting Christian Knowledge developed from this scheme. He went to Maryland in 1699 as the Bishop of London's commissary, but returned in 1706 to a living at Aldgate to work for the improvement of education in the colonies.

Bray: 1. Par. in Berks, near Maidenhead. It has a pop. of 4144 and is situated on the l. b. of the Thames. Its name is famous by reason of the ballad of 'The Vicar of Bray,' but the identity of the vicar is uncertain (see BRAY, VICAR or).

2. Popular coastal resort of co. Wicklow, Rep. of Ireland. B. is the gateway to Wicklow and its beautiful surroundings have increased its importance. The view from B. Head (791 ft) is famous. Pop. 12,000.

3. A small dist. of France, in the old prov. of Normandy, now included mainly in the E. div. of Seine-Inférieure, but also in the dept of Oise. It is on a cretaceous plateau, and is a cattle- and horse-breeding dist.

Bray, Vicar of, notorious vicar of B. in Berks. He is variously described as Simon Aleyn, Simon Dillin, or Simon Allen, and was appointed vicar during the reign of Henry VIII. He maintained his

position during the reigns of Edward VI, Mary, and Elizabeth by adopting the expedient of accommodating his religious principles to those in power. It was his aim to live and die vicar of Bray, an ambition which he achieved. The fickle vicar is made to live through the reigns of Charles II, James II, William III, Anne, and George I in the ballad *In Good King Charles's Golden Days*.

Brayley, Edward Weldlake (1773-1854), antiquary and topographer, b. Surrey. An enameller by trade, he was librarian and secretary of the Russell Institution, 1825-54, and compiled a catalogue of it. B. was part compiler with John Britton, of *The Beauties of Wiltshire*, 1801. Its success led to the *Beauties of England and Wales*, 1801-15.

Brazil, United States of, rep. of S. America. It is the fourth largest country in the world, comprising one-fifteenth of the terrestrial surface of the globe, 2600 m. long by 2500 m. broad. It extends between lat. 4° 21' N. and 33° 45' S., and between long. 35° and 70° W. Almost the whole of B. is in the S. hemisphere. Area 3,287,842 sq. m. (with internal waters).

Geography and resources. B. possesses one of the most magnificent riv. systems in the world. The Amazon, navigable throughout its course, traverses practically the entire country, and by means of its many affluent waters the whole state. Of the rivs. the more important are the Paraná, Madeira, Paranaíba, São Francisco, and Iguaçu, the falls of which are the third largest in the world. The Rio Grande and the Uruguay also drain large tracts of country. It is now possible to travel 6446 m. on the riv. systems of B. in Brazilian steamboats. B. is a country of many mt. ranges. Half of its surface consists of an elevated plateau, the mean altitude of which is from 2000 to 3000 ft. with here and there an isolated range of mts. from 5000 to 7000 ft. high (Itatuba, 9800 ft.). The highest summits are towards the E. coast, ranging from São Francisco on the N. to the S. part of the state of Rio Grande. The other prin. ranges are those of the Brazilian Andes, where nearly all the affluents of the Amazon have their source, and those ranges which separate the valleys of the Amazon and Orinoco. The coastal range is divided into the Serra do Mar, Serra do Orgão, Serra da Estrela, Mantiqueira, Tingua, Espinhaço, Pyrenees, and Paraná plateau. The resources of the rep. are practically inexhaustible. Rubber, rare timbers, medicinal plants, nuts, oils, wax, coffee, sugar, cotton, cocoa, tobacco, and practically all the precious and semi-precious metals are found or grow in comparative abundance, and it may safely be said that no country on earth is so rich in natural resources as B. The 'fine hard Pará' rubber is the best rubber in the world. Fibre-producing plants too, are, one of the greatest sources of wealth in the rep., and increasingly exploited. These are chiefly employed in making sackings for the export of coffee. Canna-ham, or Brazilian hemp, is a valuable

plant, cultivated in the state of Rio on 1,000,000 sq. metres of land. Sisal and pita are also extensively grown. Unfortunately it does not pay to export any but the finest timbers, by reason of heavy carriage rates. The hardness of most varieties renders them less acceptable to furniture-makers than they were half a cent. ago. On the other hand, peroba, vinhatico, ipê, canella, piuma, and other woods are marketable, and fetch high prices locally. The exportation of nuts is large, including babaco for industrial use, and that of medicinal plants, quinas (furnishing cinchona), angelica, quassia, gentian, and ipecacuanha is even more considerable. Agriculture is principally concerned with coffee, sugar, cotton, cocoa, and tobacco. The average ann. crop of coffee is about 900,000 tons. Probably nearly four-fifths of the world's coffee production is from São Paulo alone. About 2,000,000 tons of sugar are produced annually. Cereals are secondary to these, but by no means unimportant. Cocoa and tobacco are also produced and exported. In 1952 cattle were estimated at 56,000,000; swine, 30,000,000; sheep, 16,000,000; horses, 7,000,000; and goats, 9,000,000. A great number of head of stock are exported, and much is utilised for canning or meat essence.

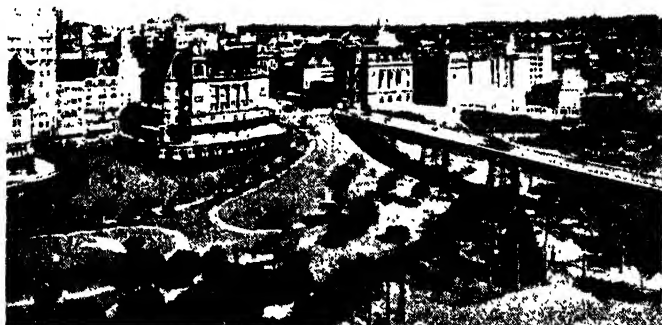
Minerals. The metals, precious and semi-precious, are found in comparative abundance, the prin. gold-mines being situated in Morro Velho and Passagem in the state of Minas Gerais. The average yield is 12 gm. per ton. The ann. yield is some 4 tons. The total ann. value of diamonds exported averages £120,000. The prin. diamond fields are near Diamantina in Minas Gerais, Bagagem, Canavieiras, Grão Mogol, Goiás, and central Baía. They produce up to 400,000 carats a year. Other minerals of importance found in B. are coal, agate, amethysts, asbestos, beryls, copper, graphite, jasper, iron, lead, manganese, talc, petroleum, and monazite. The production of minerals was greatly increased as a result of B.'s participation in the Second World War, and has become a growing and permanent part of the country's industrial economy. Iron ore is mined principally in the state of Minas Gerais; manganese in Minas Gerais, Matto Grosso, and Baía; chrome ore in Baía; tungsten and nickel in Goiás, bauxite in Minas Gerais, Espírito Santo, and Maranhão.

Exports and imports. Coffee at one time held a dominating place in B.'s export trade, and together with raw cotton occupied some three-quarters of the total exports. This proportion was reduced to below 40 per cent as a result of industrial development and increased mineral production. In addition to minerals, coffee, and cotton, commodities exported include mainly rubber, tobacco, hides, frozen meat, and cocoa. Imports consist chiefly of machinery, industrial and transport equipment, coal and coke, and chemicals. In 1954, total imports were valued at some £1052 million and exports at some £817 million.

Ethnography. The native races may be

roughly divided into the Carib, Arawak, Tupi-Guarani, and Tapuyan or Ges stocks, and among these we find the characteristics of the Mongolian and Proto-European elements which go to make up the Amer. red race. Constant wandering, intercrossing, regrouping, and other causes have contributed to racial confusion. The Arawaks are widely distributed over an area extending from the R. Paraguay to the extreme N. of the S. Amer. continent; the Tupi-Guarani occupy a ter. as vast as that between the R. Maroni in Fr. Guiana and the Plate to the S.; the Tapuyan tribes are found E. of the Cordilleras from the peninsula of Goajira on

up the Araguaya R., but was reported lost in the same year. The religion of most of the Arawaks and Tupi centres on the figure of Jurupari, a species of forest demon, whose cult bears a strange resemblance to freemasonry. Should any woman of the tribe see his symbols or the attributes of his ritual, she is immediately poisoned, tribal freemasonry being placed on a masculine basis. The non-aboriginal inhab. of the country are principally of Portuguese origin, but Basque, Slavonic, Teutonic, and Syrian elements are also present. Large numbers of Asiatic settlers—Japanese, Syrian, Chinese—help to swell the pop. Large Ger. colonies exist in



Canadian Pacific

SÃO PAULO, BRAZIL: VIADUTO DO CHA

the N. to the borders of Chile; whilst the Caribs extended from the Upper Xingú in the heart of B. to Cuba and Haiti in historical times. All these peoples, except where they have come into contact with civilisation, live the life of hunters, trappers, and fishers, and the majority of them dwell far from civilised communities. There is, however, still a *terra incognita* for the European explorer in the heart of B. The unknown region of B. is the country to the NE. of Cuyabá lying beyond the Rio das Mortes or R. of the Dead, and watered by the Araguaya and Tocantins rivs. No successful exploration of these riv. valleys has yet been accomplished by any white man, nor indeed is there any record of any seriously organised attempt, since the time of the old Portuguese pioneers, to do so. An Amer. expedition, which braved the hostility of the Chavantes and other Indian tribes of the region, was massacred to a man in 1897. In 1925 Col. Fawcett, the Eng. explorer, with 2 other men, set out to find a supposed white people in the heart of the continent

various parts of the country, and indeed Ger. expansion became a feature of modern Brazilian life, the Teuton having turned some of the best parts of the country into veritable national preserves. In 1740 the pop. was estimated at 175,000, three-quarters of which was made up of Indians, Negroes, half-breeds, Mulattos, and Mamelucos (mixture of white and Indians). By 1818 it had grown to about 3,000,000. This figure, however, is exclusive of uncivilised Indians, and it is estimated that of the total pop. at this time not more than one-third were free white inhab. The number of slaves was probably greater than the number of free white men, and the remainder of the pop. was made up of freed men and civilised Indians. From 1872 census figures are available and these show the pop. as 10,112,061 in 1872; 14,333,915 in 1890; 17,318,556 in 1900; 23,414,177 in 1910; 30,635,605 in 1920. In 1955 it was estimated at 58,500,000. Portuguese is the official language. German and Italian are also spoken in the S.

Administration. The United States of

B. are divided into 20 states, each with its own constitution and separate administrative and legislative and judicial systems, and united in a federal gov. The names of the states are as follows: Alagoas, Amazonas, Bala, Ceará, Espírito Santo, Goiás, Maranhão, Matto Grosso, Minas Gerais, Pará, Paraíba, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Norte, Rio Grande do Sul, Santa Catarina, São Paulo, and Sergipe. In addition to the states, there is the federal dist. of the city of Rio de Janeiro, Acre ter., and Região da Serra dos Aimorés, a ter. in dispute between the



E.N.A.

MEKUBENGOKRA-KAYA'PO INDIAN
OF THE MATTO GROSSO

states of Minas Gerais and Espírito Santo. Of these the oldest is the ter. of Acre on the frontiers with Peru and Bolivia. Five other frontier ters. under federal administration were created by decree in 1943 and were made up of areas taken from existing states. The names given to them are Amapá, Rio Branco, Guaporé, Ponta Pora, and Iguaçu; they border on the frontiers with Fr. and Dutch Guiana, Venezuela, Bolivia, Paraguay, and Argentina. The is. of Fernando Noronha in the S. Atlantic was also declared a federal ter. in 1942 as a result of its strategical importance.

A new constitution, restoring democratic gov., was created by decree on 1 Mar. 1945 and revised 18 Sept. 1946. This constitution envisaged a Chamber of Deputies elected for 4 years, each state returning a number of deputies (not more than 35 or less than 5) in proportion to its pop. The Senate consists of 2 representatives from each state and from the federal dist., their term of office being 8 years. The vote is compulsory for all

Brazilians of both sexes over 18 years of age. This constitution was modified as a result of the election of Gen. Dutra to the presidency in 1946. Rule by decree finished on 18 Sept. (1946), when the new constitution was promulgated. Under it the presidential term is reduced to 5 years; but the powers vested in the president, including the right to choose his own Cabinet, are still the pivot of a system in which the features of presidential gov. as practised in S. America—including a strong presidency—are substantially preserved. But the new constitution expressly recognises freedom to engage in party politics, from which only parties opposed to democratic gov. are excluded. There is considerable modification of the clauses of the previous constitution, which stipulated the progressive nationalisation of banks, insurance companies, and public services operated under concession. In prescribing that ordinary legislation shall devise the rules governing these entities, the 1946 constitution has lost some of the hotly disputed nationalism which characterised both the 1934 model and its own original draft.

Religion. In 1889 connection between Church and State was abolished; it was restored by the 1934 constitution, but again abolished in 1946. The religion is preponderantly Rom. Catholic, and B. is represented at the Vatican. There are 3 Rom. Catholic archbishoprics. Protestants in B. number something under 2,000,000, divided among a number of evangelical sects. There are also a number of Buddhists and Muslims.

Education. Education is free throughout B., and in some states is compulsory. The univ. of B. is located in Rio de Janeiro, and was founded on 7 Sept. 1920. There are also 3 univs., privately conducted, at Belo Horizonte, Curitiba, and Porto Alegre. There are (1952) some 84,000 primary schools and 2500 secondary schools, with over 1000 commercial and industrial schools.

Armed forces. Under the military law of 1923 military service is obligatory on all Brazilians from 21 years of age to 44 years: 1 year being spent in the ranks, and the remaining years in the first and second line reserve. By decree (9 Jan. 1945) the age of compulsory service was extended to cover the years 18 to 44. Peace-time strength of the army is about 200,000 all ranks. The navy is in a high state of efficiency, the revolts of recent years notwithstanding, and the whole navy was reorganised under a U.S. mission, with U.S. armaments and materials. Its prin. object is defence of B.'s enormous coastline. It consists of 2 battleships (19,000 tons displacement), 3 small protected cruisers, 9 destroyers, a coast defence vessel (3000 tons), 3 riv. monitors, 3 submarines, and a number of smaller craft and riv. boats. Six more destroyers are being built in B. The personnel of the navy amounts to about 1300 officers and 25,000 men. There is an air force of 5 regiments with a strength of 5000 personnel; this was made independent of the army or navy in 1940.

Communications. There are 22,800 m. of railway, falling into 4 categories: federally owned and managed; federally owned but managed by a State or private undertaking; State owned and worked; privately owned and operating under Federal or State concession. The shortage of roads greatly hampers the development of the hinterland. Air services within the country are maintained by 21 national air lines. In normal years Brazilian ports clear some 51,000,000 tons.

Towns. In the prin. cities of B. modern civilisation may be seen at its best in S. America, the police, sanitary, hospital, and other services being of the most advanced description, and equal to those of the first European cities. The cost of living is high. The Brazilians of the cities are cultivated, and passionately attached to literature, music, and the arts, and national expansion on these lines has been rapid. Rio de Janeiro is the cap. city (pop., 1950, 2,303,000). Other large cities are São Paulo (2,017,000), São Salvador da Baía (500,000), Recife (512,800), Belem (223,000), Porto Alegre (375,500), Belo Horizonte (339,000), Fortaleza (205,000), Niterói (171,000), Maceló (199,000), Curitiba (138,600), and Santos (207,000).

History. B. was discovered by Pedro Cabral, a Portuguese navigator, on 25 April 1500. Adventurers soon swarmed into the country, over which a governor-general was appointed in consequence of their irregularities. The French, Spanish, and Dutch made many attempts to wrest the land from its original colonists, but all of these were unsuccessful, and, the invaders finally rebuffed, a period of peaceful development set in. In 1699 the goldfields of Minas Gerais were discovered, and the interiors of the states of Baía, Goiás, and Matto Grosso were opened up and settled by groups of adventurers called *Bandeirantes*, who were attracted to those regions by stories of the fabulous wealth they were said to contain. In 1808 Brazilian ports were opened to European commerce, and in 1821 a constitution was granted by the Portuguese Crown, but the Portuguese Cortes afterwards repudiated it, a step which was followed by the declaration of the independence of B. by the patriotic young prince regent, who proclaimed himself as Pedro I. In 1831 he was compelled to abdicate, and the second and last emperor came to the throne in 1843. In 1865 the Paraguayan war commenced, and was carried on until 1870, by which time the pop. of the rival state had become practically decimated. It cost upwards of £63,000,000, and many valuable lives. In 1888 slavery was abolished, and in 1889 the emperor was forced to leave B., and a rep. was proclaimed. Under a new and enlightened constitution, and a succession of patriotic presidents, B. enjoyed a season of peace and prosperity such as was not experienced since its colonial times. In 1904 the third Pan-Amér. congress was held in B., and did much to bind closer the bonds existing between her and her

neighbours. In the First World War B. remained neutral for more than 3 years. She had a much closer intellectual and cultural affinity with France than with Germany. A pro-Ally league was formed soon after the outbreak of hostilities and material aid was furnished to the Red Cross organisations of the allied forces. But the fact that an important part of the immigrant pop. of B. was German added to the difficulties of the Brazilian Gov. B. protested against the Ger. announcement of unrestricted submarine warfare in Jan. 1917, and the persistence of Germany in that policy led to the sinking of Brazilian ships in 1917. This caused the severing of diplomatic relations. Some 50 Ger. vessels which had been confined to the Brazilian harbours were seized by the Brazilian Gov. B. still remained neutral even after the entry of the U.S.A. into the war, and on 6 April 1917 she issued a declaration of neutrality. But after it became evident that Germany did not intend either to give up her submarine policy or to make reparations for the Brazilian ships which had already been sunk, on 26 Oct. 1917 Congress adopted a resolution recognising the existence of a state of war with Germany. Brazilian aviators joined the allied armies and a naval squadron was dispatched to European waters to co-operate with the allied fleets. Besides this, a number of hospital units and doctors were sent to Europe. The years following the war were characterised first by a period of reckless prosperity under boom conditions during the presidency of Dr Epitácio da Silva Pessoa (1919-22), and secondly by a period of financial depression during the presidency of Dr Arturo Bernardes (1922-1926). The Gov. was, however, strong enough to survive a serious military uprising in 1924, and in the elections of 1926 Dr Washington Luiz Pereira da Souza was elected president unopposed, and great advances were expected. Delayed reforms, however, precipitated a revolution against the regime of Dr Washington Luiz in Oct. 1930. In that month civil war broke out. The revolution, which began in the Rio Grande do Sul, had been 3 months in preparation, but despite rumour the secrecy of the revolutionaries' plans deceived the Gov., and though federal troops were concentrated in Porto Alegre in the previous Aug., these were withdrawn in Sept. On 3 Oct. Senhores Flores da Cunha, Osvaldo Aranha, and a number of officers made their final arrangements for arming the civil guard, attacking the general barracks, and seizing the arsenal. The federal leader, Gen. Gíl de Almeida, and his forces were taken by surprise; the barracks and arsenal soon fell, and a number of federal troops, including a battalion of sharpshooters, went over to the revolutionary movement, though only after a stout resistance. Meanwhile the branch offices of the Bank of Brazil, the postal dept., and other prin. offices were occupied by the revolutionaries, and popular enthusiasm for the movement increased, thousands volunteering for

service in response to a revolutionary call for recruits. Beyond the limits of Rio Grande some 50,000 men were soon in the field and half that number in training. By 24 Oct. the movement had secured the desertion of the garrison of Copacabana Fort, Rio de Janeiro, and alarm, aggravated by revolutionary literature, scattered by plumes, spread through the cap. When soon afterwards the cap. rose in revolt, the hostilities ceased, and Dr Luiz was transferred a prisoner to Copacabana Fort, power passing to Dr Getúlio Vargas.

Throughout 1931 Vargas's provisional gov. ruled by decree, the national and state legislatures being dissolved pending the framing of a new constitution and electoral law. Elections for a constituent assembly were held in 1933, and the assembly promulgated the constitution of 16 July 1934. Dr Vargas was elected president and assumed office on 20 July. The following year (Nov. 1935) a 'communist revolution', as it was called, was the occasion for placing the country under semi-martial law, which continued for 2 years, and amounted to a 'state of war' in 1937 during the time of the campaigns for the elections fixed for Jan. 1938. On 10 Nov. 1937, however, President Vargas by a *coup d'état* closed Congress and abolished the former political parties, issuing a new constitution for a corporative state, pending popular approval, of which he became virtual dictator. The former Congress, consisting of a Senate and a Chamber of Deputies, was replaced by a single 'parliament' combining a Chamber of Deputies and a Federal Council, the latter consisting of representatives elected by the state assemblies, plus 10 members nominated by the president. The new constitution was held to have leanings towards Fascism, but this was denied. The following year relations between Germany and B. became strained as a result of suspected Ger. complicity in the so-called 'Green Shirt' revolt led by Salgado and the Integralist party. This was rigorously suppressed. Vargas pursued a policy of economic nationalism, together with the centralisation of industry, and he set in hand the gradual reduction of the export taxes between the states of the union. In April 1938 the petroleum industry was nationalised. State autonomy was further curtailed the following year. During the early years of the Second World War B. strengthened its defences, and President Vargas took measures to counter pro-Axis propaganda and to renew economic and military ties with the U.S.A. B. entered the war against Germany and Italy on 22 Aug. 1942, and on 6 Feb. 1943 declared adherence to the Atlantic Charter, extending the declaration of war to include Japan. A Brazilian expeditionary force served on the It. front, and in the supply of minerals, rubber, and other raw materials B. made a notable contribution to the war effort of the U.N. On 29 Dec. 1943 a covenant was also signed between B. and Portugal, strengthening the cultural ties between the 2

countries. On 1 Mar. 1945 President Vargas signed a new constitution and undertook to make considerable concessions towards popular gov. In April an amnesty of all political prisoners was declared, and the president signed a decree to enable presidential elections and elections for Congress to be held in Dec. On 30 Oct., however, Vargas was compelled by a military *coup d'état* organised against him to relinquish power in favour of Dr José Linhares, president of the Supreme Court. The election held on 2 Dec. resulted in the elevation to the presidency of Gen. Enríque Gaspar Dutra, who had been minister of war from 1926 to 1945. He was the head of the newly formed Social Democratic party which stood, *inter alia*, for the formation of a federal democratic rep. to be brought about as the result of constitutional reform. He was the first president to be elected by popular vote since 1926. The Constituent Assembly met in Feb. 1946, with the task of drawing up a new constitution, which superseded the suspended 1934 constitution in Sept. 1946. In 1947 B. outlawed its Communist party, and ordered the suspension of the Communist-controlled B. Workers' Confederation and all unions affiliated with it. In Oct. (1947) diplomatic relations with Russia were severed. After a brief return to power, Vargas committed suicide, and after a new election President Kubitschek was proclaimed in 1956.

Literature. Writing with a national flavour helped to form the new land of B. long before she became a modern state, independent of Portugal. Nations are born of the spirit and it is right that an epic poem in praise of Pernambuco (the *Prosopopoeia*) should be the earliest work of a Brazilian to gain lasting fame. It dates from the end of the 16th cent. Its counterpart in prose followed in the next cent., the laudatory and analytic *Dialogue of the Grandeur of Brazil* by the economist and publicist Ambrósio Fernandes Brandão. Despite, or because of, the 60 years' bondage of the home country under the Sp. crown (1580-1640), a truly national voice was heard, that of the lyricist, moralist, and, above all, satirist Gregório de Mattos, well named 'Hell'-Mouth.'

Poetry. Increased activity in the 18th cent. reached its peak in the School of Minas Gerais poets. Arcadian in expression, *Martília de Dirceu* by Tomás Antônio Gonzaga is still one of the most inspired love-poems in the language. Then, partly influenced by France though with genuine local colour, came the 'Indianist' writings such as the ten-canto epic *Caramuru* (idealising a Brazilian chieftain) by Santa Rita Durão, and Basílio de Gama's *Uruguai*, a story of racial conflict. Such works paved the way for the transition to the Romantic period proper. The *Poetical Signs* of Gonçalves de Magalhães, the first poet of his kind in B., was soon followed by the ever-popular *Song of Exile* of Gonçalves Dias. After the Romantic, a Parnassian period followed, well represented by

Machado de Assis and Raymundo Corrêa (*Everything is Pain*). The master of this Parnassian technique was Alberto de Oliveira, whose *Grecian Cup* is amongst the most finely wrought verse in the language. Olavo Bilac (1865-1918) wrote very skillfully in the erotic vein, and is celebrated for his Banderante epic *Emerald Hunter*. Brazilian poetry shows a preoccupation with personal as much as national destiny—perhaps the very size of the country contributes to this—and the sonnet, always a particularly personal form, remained exceedingly popular up to 1920. Symbolism has had few notable exponents in B. The two most justly famous modern poems are Menotti del Picchia's *Juca Mulato* (a romantic love-story) and Guilherme de Almeida's *Messidor*. After the First World War Modernism was fomented by Graça Aranha, Manoel Bandeira with his mixture of tenderness and irony, and the group of 'Cannibals.' Its greatest single expression was the 'week of modern art' for which São Paulo provided the forum in 1922. Free verse came into its own, Mário de Andrade and Carlos Drummond de Andrade being its finest protagonists. The outstanding modern figure, however, was undoubtedly Jorge de Lima (d. 1953), whose folklore poem of sociological content, *That Black Girl, Fulô*, enshrines a true and eternal 'brasiliidade.'

Prose. B.'s best prose has tended steadily more in the direction of inquiry into social justice. The Indianist novel found its finest representatives in the 19th cent. with José de Alencar (*Iracema* and *The Silver Mines*), Bernardo Guimarães (*Iscara, the Slave-girl*), and Esmeralda Tannay (*Inocência*). The theme of *Inocência*, a simple-minded country girl's love for a stranger, gives the author scope for naturalistic description and some degree of social comparison; these point to two important future trends in Brazilian writing, which reached the heights of realism and psychological perception with the work of the mulatto J. M. Machado de Assis (*Mr Grumpy, Quincas Borba, Posthumous Memoirs of Brás Cubas*), who is of world stature. The sociological novel has as its outstanding representatives *The Backlands*, 1902, by Euclides da Cunha, and the works of various regional novelists, such as *The Year Fifteen* by Raquel de Queiroz, which tells of the drought-stricken north-east, and the *Urupês* which made Monteiro Lobato famous and enabled him and his *Revista do Brasil* to have such great significance for modern writers. This trend culminated in the studies of Brazilian working life by Jorge Amado, notably his *Lands of the Unending*. Among his precursors were the historian Capistrano de Abreu, Sylvio Romero (*History of Brazilian Literature*), and Mário de Andrade, author of a curious slang allegory *Macunaima*, about the Indian chief and the big city.

Drama. The theatre has not traditionally produced great literature in B. One modern dramatist has, however, had great stage successes, namely Joracy Camargo

with his *God Bless You!*, trans. into many languages. Ildi Boneca, Ernani Fornari's play about family life in the 1880's, was also an outstanding success. See Isaac Goldberg, *Brazilian Tales*, 1921; Ericeo Verissimo, *Brazilian Literature: an Outline*, 1945; Samuel Putnam, *Marvellous Journey*, 1948; J. B. Trend, *Modern Poetry from Brazil*, 1955.

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Brazil Cabbage, or Chou Carabi, term applied to sev. species of *Araceae* of the genera *Xanthosoma*, *Colocasia*, and

Caladium. They have edible rhizomes and the leaves are also eaten.

Brazil Nut, see BERTHOLLETTIA.

Brasilwood, commercially supplied by various species of *Caesalpinia*, is now identified as a separate genus, *Guilandina echinata*. It is dark red in colour, and its biggest use is for the manuf. of violin bows. See TIMBER.

Brazing, see SOLDER and SOLDERING.

Brazos, riv. of Texas, U.S.A. It rises in the Staked Plain and runs 950 m. in a SE. direction, emptying itself finally in the Gulf of Mexico. It is navigable for 40 m. at all times, but at high tide for 250 m.

Brazza, Pierre Paul François Camille Savornan, Comte de (1852-1905), Fr. explorer and administrator, the founder of the Fr. Congo, of It. birth, b. on board ship in Rio de Janeiro harbour (became a Fr. citizen while engaged in the exploration of the Ogoué (or Ogowé). He made the exploration of the Ogoué in 1878, and later received from the Fr. Gov. 100,000 francs for exploration in the Fr. interest in the Congo. Here he secured large tracts of land for France and estab. many stations. He returned again later, and within 2 years estab. 22 outposts, of which Franceville was the chief, distributed over a space of 500,000 sq. km. In 1885 B., following a new trail, estab. on Lake Chad the junction of Fr. possessions in the Congo, the Sudan, and N. Africa. He was made governor of the Fr. dependency of the Congo in 1886. That post he held till 1898, when an inquiry was instituted regarding criticism of his administration, but he was acquitted. In 1905 he organised an expedition to ascertain the truth of certain rumours of cruelty to the natives and *d.* at Dakar. See Jacques Stern, *The French Colonies: Past and Future*, 1944.

Brazza, see BHAC.

Brazzaville, cap. of Fr. Equatorial Africa, situated on the r. b. of the R. Congo, about 300 m. from its mouth, on the frontier between Fr. Middle Congo and Belgian Congo. B. was founded in 1886. It is connected with Pointe Noire (320 m.). Following Brazza's negotiations with the celebrated King Makoko of the Congo, the Fr. flag was hoisted at N'Tamou, the key to conquest of the Congo, and this place later became B. Pop. (estimated), 1946, 25,000, of whom 900 were Europeans.

Brčko, in Bosnia-Hercegovina, Yugoslavia, on the Sava. It grew up around a Turkish fort, and is the centre of a rich agric. region. Pop. 11,350.

Breach, legal word connoting the violation of a duty imposed by the terms of a written agreement or by the policy of the law. A B. of contract is where 1 of 2 parties to a contract or an actionable agreement breaks an obligation which the contract or agreement imposes upon him. The consequences of a B. of contract are that a right of action is at once conferred upon the party injured by the B., while in some cases, e.g. in contracts to supply a consignment of goods by instalments, the injured party is exonerated or 'discharged' from performing the rest of the

obligations imposed upon him. Not every B. of contract amounts to a B. of a vital condition so as to entitle the injured party to rescind. Some B.s are said to be merely of 'warranties,' as distinct from conditions, and entitle the injured party to sue for damages only. A B. of Covenant is where a party breaks a clause in an agreement (usually under seal) whereby the covenantor either vouches for the truth of certain facts or binds himself to perform or give something to covenantee. B. of Promise means the B. of any promise the fulfilment of which is legally enforceable, but the phrase has become especially associated with the B. of a promise to marry. A B. of Trust means the non-fulfilment by a trustee of duties accepted by him, and imposed upon him by the terms of the trust instrument. In cases of fraudulent conversion of trust property the trustee is liable to criminal as well as civil proceedings. B. of the Peace in criminal law connotes any act producing or tending to produce a B. of the queen's peace, e.g. murder, affray, assault, challenge to fight either by word or letter. The queen's peace is a comprehensive notion by the aid of which the Crown establishes a right to be a party to all criminal proceedings or pleas of the Crown. It has its origin in ancient feudal times when the king was actual overlord of the realm, and an affray therein was therefore justifiably deemed to be analogous to an insult offered to a guest in a private house. Prison B. denotes an actual breaking out of prison as distinct from a mere escape. The consequences vary according to the crime for which the prisoner is in custody. Pound B. is the common law offence of rescuing goods from the custody of the law after the officer of the court has impounded them upon a distress. Prosecutions seldom take place, as the landlord can recover treble damages by a civil action. B. of Arrestment in Scots law means the paying away of money in one's hands on which a legal 'arrest' has been laid, thereby manifesting a contempt for the law. See CONTRACT.

Breaching Tower, see BEFFROI.

Bread, food prepared by baking flour obtained by grinding cereals, e.g. wheat, rye, millet, barley, oats, and maize, or other vegetable products, e.g. beans, peas, tapioca, etc. Bread-making appears to have been practised from the very earliest times, as cakes of barley have been discovered in Stone Age dwellings. Baking was understood by the ancient Egyptians and Chaldeans, and it is recorded of Abraham that he commanded Sarah to make ready 3 measures of fine meal, knead it, and make cakes upon the hearth. The grinding of grain appears to have been one of the duties of the womenfolk of ancient households. The primitive mill consisted of 2 cylindrical stones, the upper one revolving about an axis fixed in the centre of the lower one. A hole bored eccentrically through the upper stone admitted the grain, which was thus ground between the flat surfaces of the 2 stones. A handle fixed in the

rotating stone enabled the woman to turn it round, and in the case of a large mill the work was performed by 2 women sitting opposite each other. Such an arrangement is referred to in the prophecy 'Two women shall be grinding at the mill; one shall be taken, and the other left.' The Romans estab. public bakehouses, from which free distributions of B. took place. Throughout Europe the place of B. as the most important food-stuff has been unquestioned from the time of the Rom. empire. In temperate lats. by far the most important source of bread flour is the grain of wheat. In more northerly lats., rye, oats, and barley are used; maize flour is made into cakes in parts of the U.S.A., and millet B. is used in the S. parts of Europe. Wheat flour consists approximately of starch, 72 per cent; nitrogenous matter, 14 per cent; water, 10 per cent; fats, 2.25 per cent; and mineral salts, 1.75 per cent. When a larger proportion of the outer covering of the grain is milled, the relative amounts of starch, mineral matter, etc., are altered. The essential stages in the making of ordinary B. are the making of dough, in which the flour is moistened, salt added, and yeast introduced; the 'rising' of the dough, when the yeast multiplies in the material, giving rise to little vesicles or bubbles of carbonic acid gas; and the actual baking. The effect of yeast (q.v.) is to make the B. light, and B. thus prepared is the chief food of civilised peoples, being in general more palatable, and digestible than the closer-textured, unleavened variety. In making what is called aerated B., the carbon dioxide is first dissolved in water under pressure, and the flour mixed with the water while still subjected to pressure. The dough is ejected from the machine and is cut into loaves as it emerges; it then 'rises' owing to the liberation of bubbles of carbon dioxide in the interior. Baking-powders are also used for the purposes of causing bubbles of gas in the dough. They consist of 2 substances such as sodium carbonate and tartaric acid, with perhaps an admixture of flour to effect a more uniform distribution. The powder is mixed with the flour, and when kneaded with water the carbonate is acted upon by the acid, with the result that carbon dioxide is liberated. As tartaric acid is frequently impure, other baking-powders containing phosphoric acid or alum and potassium bisulphate are frequently used. In mixing the dough on a large scale a 'sponge' is first prepared. This consists of part of the flour to be used mixed with a large proportion of water and the amount of yeast required for the whole batch, together with a small quantity of salt. The sponge is allowed to ferment for from 6 to 10 hrs. and then mixed with the rest of the flour, water, and salt. The kneading which is required for the mixing of the dough is often done in a machine consisting of a trough or cylinder in which blades revolve, thus thoroughly incorporating the different materials. The baking is done in an oven consisting of a vaulted chamber about 10 ft long, 8 ft

wide, and 2½ ft high. The heating is effected by a furnace or by means of superheated steam carried in pipes on the top and bottom of the chamber. B. in Great Britain must be sold by weight, and must not be adulterated by substances specified in the Weights and Measures Act, 1889. See T. B. Wood, *The Story of a Loaf of Bread*, 1913; D. W. Kent-Jones, *The Practice and Science of Breadmaking*, 1934; H. E. Jacob, *6000 Years of Bread*, 1944.

Bread-fruit is obtained from *Artocarpus incisa*, a tropical species of Moraceae which flourishes chiefly in the S. Sea Is. The fruit is spurious and forms a sorosis; it is roasted by the natives and eaten as



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BREAD-FRUIT

bread. The Nicobar B. tree is *Pandanus odoratissimus*, a species of Pandanaceae, and the Australian B. tree is *Garcinia edulis*, a species of Rubiaceae.

Bread-nut, fruit of *Brosimum alicastrum*, a tree of the family Moraceae, which grows in tropical America and the W. Indies. This fruit is an achene, and is edible when cooked. The Barbados B. is a var. of *Artocarpus incisa*, the bread-fruit (q.v.).

Bread-root, or prairie turnip, name given to the edible tuberous roots of *Psoralea esculenta*. The plant is leguminous, and occurs in N. America. The yam (q.v.) has similar roots, and both are eaten boiled or raw.

Bread-tree, sev. species of *Encephalartos*, an African genus of Cycadaceae. The pith is rich in starch, and is made into meal by the Kaffirs. *E. caffer* is known as Caffre, or Kaffir, Bread. The Bread-fruit tree is *Artocarpus incisa* of Malaya; The Bread-nut tree, *Brosimum alicastrum*, of Jamaica; the fruits being edible.

Breadalbane, Scottish title assumed by John Campbell, son of Sir John Campbell, about the year 1677. He had played an important part in the political hist. of Scotland, and practically by purchase

became Earl of Caithness. He was, however, compelled to relinquish this title, and was in 1681 created Earl of B. and Holland, and received also a viscounty and 4 baronies in the peerage of Scotland. Although a Presbyterian, he helped Lauderdale, and on the accession of William III, was one of the few men of authority in Scotland. He was entrusted with the task of pacifying the highlands, and he succeeded in his object, gaining wealth in the process. He was partially responsible for the Glencoe massacre, although his share in the atrocity did not become known until later. He sat later as a representative peer in the Brit. House of Lords after the Union, although he had not voted for the Union. Later, during the '15 he gave assurances of loyalty to both sides. He d. in 1717. He was succeeded by his second son, who became Earl of B., and who d. in 1752. The third earl, the eldest son of the second, was noted as a diplomatist who occupied high positions in the diplomatic service, being ambas. to France and Russia. He was a strong supporter of Sir Robert Walpole, and d. in 1782. He was succeeded by a cousin, who became Marquess of B. in the Eng. peerage. With the decease of the second marquess the marquessate became extinct, but the earldom passed again to a cousin, whose family still retain the title, and to whom the marquessate was restored in 1885.

Breadalbane, mountainous dist. of Perthshire, Scotland, lying for the most part around Loch Tay. It covers over 1000 sq. m. In it are sev. peaks of the Grampians, Ben Lawers (3984 ft) being the highest. There are deer forests and fishing in Lochs Tay and Rannoch.

Breadth (in art), term applied to a picture indicating a certain effect of grandeur. If a picture possesses breadth no one detail strikes the spectator more than another, but he views the picture from a general standpoint. This effect is sometimes obtained by putting as few details as possible into a picture, a great deal being dependent upon the proportions of light and shade. Turner's pictures are among those specially characterized by their breadth of treatment.

Breakbone Fever, see DENGUE.

Breakdown, in electrical engineering, failure of insulation in a circuit due to over-voltage (q.v.), or the bridging of a protective gap by a spark.

Breakspear, Nicholas, see ADRIAN IV.

Breakwater, barrier erected for breaking the force of water on the coast or outside a harbour and producing a calm within. Natural B.s also exist, such as the Isle of Wight, which occupies a position protecting Portsmouth and Southampton. Piers may also be constructed to serve as B.s, but the term B. strictly applies only to a structure built solely for protection. B.s are of 3 classes: (1) Vertical structures of built masonry. The B. at Aberdeen and the Dover Admiralty pier are examples. (2) Sloping structures of rubble stones dropped into the sea from floating barges or timber stages. These have a sloping face each side. The

Plymouth B. is an example. (3) Composite B.s involving both the above principles. Cherbourg B. is an example.

Plymouth harbour is one of the finest B.s in existence. The designs are by Rennie, and it was begun in 1812 at an estimated cost of £900,000. The stone was obtained from a neighbouring quarry, transported by rail and shipped in vessels fitted with trapdoors and deposited through these in the shape of a huge mound. The mound was to be 10 ft above low water, with a width of 30 ft on top. The movement of the waves and constant storms, however, severely changed its shape. In 1824 about 800 yds of the finished work was overthrown by a severe storm. After this it was raised 10 ft higher, and the width extended to 45 ft, having a seaward slope of 1 in 5. It was finished in 1841 at a cost of £1,500,000. The B. is 1 m. long, having a central portion 1000 yds long. Two wings of 350 yds long extend at the ends of this at a slight angle. The water space protected is about 1120 ac. The B. requires constant repair.

Holyhead breakwater, designed by Randall, was erected for the purpose of converting Holyhead into a harbour of refuge. The stone was obtained from Holyhead Mts. and was run out upon a timber staging and dropped into the sea. The rubble reached up to the level of high water, and has assumed a seaward slope of 1 in 12. The inner slope is 1½ to 1. The B. shelters an outer roadstead of 400 ac., and an inner roadstead of 270 ac. The stone was obtained by blasting, 1 explosion of 21,000 lb. of gunpowder displacing 130,000 tons of stone. The estimated cost was £1,500,000. On the death of Randall the work was continued by Sir John Hawkshaw, and was finished in 1873. On it stands a lighthouse rising to the height of 70 ft above high water.

The Portland breakwater acts as a B. to the stretch of water between the coast of Dorset and the peninsula of Portland. It was begun in 1849. There is an abundance of stone in the neighbourhood, easily quarried, and the steep slopes afford facility of transport. The B. stretches due N. for more than 2 m., with 1 or 2 openings for the entrance and exit of ships. The work was finished in 1872, and consists of a rubble-stone bank surmounted by vertical walls from the low-water level.

Cherbourg breakwater is perhaps the largest and most costly ever erected. According to the original proposal made by M. de Cessart numbers of hollow cones formed of timber framing were to be sunk as close to one another as possible, and then filled with stones. These cones, numbering about 64 and measuring 70 ft high with a base diameter of 150 ft, were to form a nucleus to the stone B., and to prevent displacement of the stones by the action of the waves. This plan was abandoned in 1785 owing to the damage done to them during stormy weather, and the stone B. was continued without the aid of the cones. It was finished in 1853 at a cost of £2,500,000. Fortifications

have been added since then upon the upper works. It is nearly 2½ m. long, 300 ft wide at the base, and 31 ft wide at the top. The water space included within and protected by the B. is about 2000 ac.

Dover breakwater was built up by means of solid ashlar brought from the bottom by means of the diving bell, with the interior formed of blocks of concrete. The area enclosed is about 685 ac. It cost about \$3,500,000, and has been extended twice.

Alderney breakwater was designed for the gov. by James Walker in 1847. It is 4500 ft long, but the outer portion has been abandoned owing to the difficulty of maintaining it. It was completed in 1864, and the total cost of the structure was over \$1,500,000.

Colombo breakwaters, proposed in 1866 to afford protection for shipping, were begun in 1875, when King Edward VII, then Prince of Wales, laid the foundation stone. In 10 years' time the SW. B., 4212 ft long, was completed. In 1891 2 additional B.s. were provided, the NW., which was an is. B., and the NE., which jutted out from the land. The length of the former was 2670 ft, and of the latter 1200 ft. These were completed in 1906 at a cost of about \$170 per ft.

Marseilles breakwater, begun in 1845, has a length of about 3½ m. In its construction it consists of a layer of about 10 ft of small rubble at a depth of 55 ft below sea level, covered by layers of natural stone weighing from 2 to 80 cwt. each, and above this are artificial blocks weighing about 33 tons each. The slope is graduated in such a way that the waves are sharply cut at a point where their strength would be most effective, and their crests therefore fall harmlessly upon the masonry above.

Valparaiso breakwater presented especial difficulties in its construction, owing to the soft mud of the sea-bottom in the harbour and to the frequency of earthquakes in the vicinity. The work designed by Adam Scott, after sev. other schemes had been mooted, was carried out between 1912 and 1920. Where there was a good sandy foundation at the beginning of the work, a rubble mound was constructed with a strong blockwork structure above; but where the treacherous muddy base presented itself, huge monolithic blocks weighing over 12,000 tons took the place of the ordinary blockwork.

The introduction of concrete made of Portland cement has in recent years modified the construction of B.s. Cement is mixed with sand, gravel, and broken stone in various proportions. Sometimes the concrete is made up into large blocks and deposited under in low water. At other times it is lowered in large bags, which are opened under water and thus form a mound or basis upon which to work. See B. Cunningham, *Harbour Engineering*, 1908, 1928; E. Latham, *Marine Works*, 1926; R. N. Stroyer, *Concrete Structures in Marine Work*, 1934.

Bream, name applied to many species of fishes, the fresh-water B.s. and sea B.s. being absolutely distinct. The former

belong to the family Cyprinidae, carp-like fishes, and are distinguished by their compressed abdomen and elongated anal fin. Among these are *Abramis blicca*, white B., *A. brama*, common B., *A. crysoleucas*, Amer. shiner. The sea B.s. constitute the family Sparidae, which are perch-like carnivorous fishes, and, unlike *Abramis*, are mostly edible. Representative species are *Cantharus lineatus*, black sea-B. or old wife, *Sargus sargus*, sheep's head, and *Pagellus centrodontus*, common sea B. or chad. Ray's B. (*Brama rayi*) is a widely distributed oceanic spiny-finned fish of the family Bramidae.

Breast, external part of the thorax lying between the neck and the abdomen, also applied particularly to the *mammæ* of women. See MAMMARY GLANDS.

Breast-feeding, see CHILD.

Breast-wheel, see WATER-WHEEL.

Breasted, James Henry (1865-1935), Amer. orientalist, b. Rockford, Illinois. Educ. Yale and Berlin, studying under Erman. Became prof. of Egyptology and oriental hist., Chicago Univ., in 1905, and director of the Oriental Institute in Chicago in 1919. Collaborated in the Berlin dictionary of hieroglyphs (*Wörterbuch*). Many publs., including *A History of Egypt*, 1905; *Ancient Records of Egypt*, 1906; *The Development of Religion and Thought*, 1912; *The Edwin Smith Surgical Papyrus*, 1935. See C. Breasted, *Pioneer to the Past*, 1947.

Breastplate, metal plate of one or more parts, designed to protect the front of the body. It formed an important part of the war equipment of ant. times. See ARMOUR and CUIRASS.

Breath and Breathing, see RESPIRATION.

Breathing Pores, orifices at the end of breathing tubes in insects. Respiration is carried on by means of the air-tubes which penetrate into all parts of the body from spiracles or pores on the surface of each segment. The spiracles are closed by valves actuated by special muscles. When the valves are closed the air is driven by the contraction of the body into the finer branches of the air-tubes.

Breccia (It. *breccia*, pebble, fragment of rock), in geology, term applied to rock composed of angular fragments of a pre-existing rock or of sev. pre-existing rocks, united by a cement of mixed matter. It differs from conglomerate in the angularity of the fragments.

Brecoy, Fr. tn in the dept of Manche, situated 27 m. to the SW. of Saint-Lô. Pop. 2200.

Brechin, royal burgh and mkt tn in Angus co., Scotland, on the S. Esk, 8½ m. W. of Montrose. The cathedral, now a par. church, was founded in 1150 by David I and has a notable 10th-cent. round tower. B. was the scene of the surrender of the Scottish crown to Edward I by Balliol in 1296; Dr Thomas Guthrie and Sir Robert Watson Watt were b. here. Prin. industries are linen, jute, and rayon fabrics, machine tools, light engineering, and distilling. Pop. 7264.

Brecht, Bertolt (1898-1956), Ger. playwright and ballad writer, b. Augsburg. His first dramas gained him the Kleist

prize in 1922 (*Trommeln in der Nacht; Baal; Im Dickicht der Städte*). B. has developed a type of 'epic theatre,' meant to arouse in the spectator a direct political judgment. One of his greatest successes was the *Dreigroschenoper*, with music by Kurt Weill, 1928. More obvious examples of his political convictions are his *Vermische*, 1930-2, and *Die Rundköpfe und die Spitzköpfe*, 1938. B. left Germany in 1933 for Russia and in 1941 emigrated to the U.S.A. because he was strongly opposed to Hitlerism. Subsequently, he wrote a number of vigorous short plays and poems against Nazi Germany, collected in *Furcht und Elend des Dritten Reiches*, 1945. Most of his work combines a note of scepticism with ironical sentimentality, and the most elaborate technical devices. He also wrote ballads in the style of Villon, collected in *Hauspostille*, 1927, *Lieder, Gedichte und Chöre*, 1934, *Svenborgers Gedichte*, 1939, and *Neue Erzählungen und Gedichte*, 1949.

Breckinridge, John Cabell (1821-75), Amer. soldier, b. near Lexington, Kentucky. In 1849 he became a Democratic member of the Kentucky legislature, and from 1851 to 1855 he sat in Congress. In 1856 he was elected vice-president under Buchanan. He strongly favoured the pro-slavery party, and joined the Confederate forces, being created major-general in 1862. He fought with distinction at Stone R., Newmarket, and in co-operation with Lee at Cold Harbour. Towards the end of the struggle he was appointed secretary of war to the Confederates. At the close of the war he took refuge in Europe, but in 1868 he resumed his practice of law in Kentucky.

Breckland, dist. in Norfolk and Suffolk, England, not far from Thetford. It is sparsely inhabited and has lent itself to considerable afforestation development by the Forestry Commissioners in recent years.

Brecknock, see BRECON.

Brecknockshire, see BRECONSHIRE.

Brecon (Brecknock), municipal bor. and co. tn of Breconshire, Wales, situated almost in the centre of the co., at the junction of the Honddu with the Usk, 40 m. from Swansea. The priory church of St John (founded in the 11th cent.) became the cathedral of the new diocese of Swansea and Brecon in 1923. The choir (Early Eng.) has beautiful lancet windows; the nave is decorated. There are ruins of a 10th-cent. castle. Christ College, a public school for boys, was founded by Henry VIII in 1541. Mrs Siddons was b. in the neighbourhood. B. is the depot tn of the S. Wales Borderers (24th Regiment). Pop. 6546.

Brecon Beacons Impressive group of mts in the S. of Breconshire, Wales, the highest summit of Old Red Sandstone in the Brit. Is., of which Pen y Fan (2906 ft) and Corn Du (2863 ft) are the peaks. The B. B. National Park takes its name from these hills.

Breconshire (Brecknockshire), co. of Wales, situated between the cos. of Radnor on the N. and NE., Hereford and Monmouth on the E., Monmouth and

Glamorgan on the S., and Carmarthen and Cardigan on the W. The co. is extremely mountainous with magnificent scenery, the highest ranges being the Brecon Beacons (q.v.) and the Black Mts (q.v.), of which Pen y Fan (2906 ft) and Waun Fach (2660 ft) are the respective summits. The chief rivers are the Usk, Wye, Taft, and Tawe (qq.v.) with their many feeders. It is proposed to include more than half the co. in a National Park (see BRECON BEACONS). The prin. geological formation is that of the Old Red Sandstone (Devonian). On the S. boundary of the co. this is overlain by carboniferous limestone and the lower coal measures of the S. Wales basin. In the N. older Silurian rocks are exposed. There is evidence that the area was heavily glaciated. The co. is an important water-producing area, supplying amongst other places Birmingham, Swansea, Cardiff, and Newport. Agriculture is the co.'s chief occupation, the emphasis being on cattle and sheep rearing. Arable and dairy farming is undertaken on the lower valley lands, especially on the fertile alluvial soils of the Usk and Wye regions. Afforestation is also being undertaken extensively. Anthracite coal is mined in the extreme SW. of the co., while limestone and silica rock are worked along the S. border. Brecon (q.v.) is the co. tn. Three m. W. of Brecon is Y Gaer, the Rom. *Bannium*, some 6 ac. in extent, an excavated walled fort (see R. E. M. Wheeler, *The Roman Fort Near Brecon*, 1928). The 14th-cent. fortified manor-house of Tretrout Court, 3 m. from Criekhowell, is now an anct monument; in the Vale of Ewya are the ruins of Llanthony Abbey (founded early in the 12th cent.). Area 469,281 ac.; pop. 56,503. See Rosalind M. White, *The Land of Britain* (The Report of the Land Utilisation Survey of Britain), Part 37, Brecon, 1943; Theophilus Jones, *History of Brecknockshire*, 1909-30; Breconshire Co. Council's *County Development Plan, Report of Survey*, 1954; W. Rees, *An Historical Atlas of Wales*, 1951.

Breda, tn in the prov. of N. Brabant, Netherlands, situated at the confluence of the R.s Mark and Aa (2 canalised and navigable rivers), 25 m. WSW. of 's Hertogenbosch. It lies at the junction of sev. railway-lines, and is the seat of a Rom. Catholic bishopric. The old castle is now occupied by the Military Academy. The Protestant Great Church (Grote Kerk) contains fine mausoleums of the Counts of Nassau. The tn was once strongly fortified. The main manufs. are carpets, woollen and linen goods, leather, machines, hats, and soap. There are dye-works and breweries. B. has had an interesting hist., and has undergone many sieges. It was taken by Prince Maurice of Orange in 1590, by the Spaniards in 1625, and by the French in 1794-5. It was the subject of the Compromise of B. in 1566 (treaty of alliance against the Inquisition), the Declaration of B. in 1660 by Charles II of England, and the Treaty of B. in 1687 between England, the Netherlands, France, and Denmark. Pop. (1957) 100,360.

Bredasdorp, dist. of Cape Colony, S. Africa. The climate is fairly dry, the average rainfall being less than 20 in., but the B. dist. is the second richest in the Cape, largely owing to wool and wheat. The cap. of the dist. is B., which is situated 35 m. SW. from Swellendam, and is the most S. of all the small towns of the Cape, being 26 m. from Cape Agulhas (q.v.). It has a national park for preserving herds of bontebok. Pop. (dist.) whites, 1807; coloureds, 2035; others, 153.

Bredero, Gerbrand Adriaenssen (1585-1618), Dutch poet and dramatist, b. at Amsterdam, a shoemaker's son. In 1611 he dramatized a romance, entitled *Roderick and Alphonsus*. His original genius, however, first showed itself in his *Farce of the Cow*, 1612, and from that time there flowed from his pen a stream of comedies remarkable for their picture of Amsterdam life. In his *Jerolimo, the Spanish Brabantier*, 1617, he mocked at grandiloquence of the exiles from the S. His plays are full of wit and humour, although at times they lapse into coarseness. See J. ten Brink, *G. A. Bredero* (3 vols.), 1888, and J. A. N. Knuttel, *Bredero*, 1949.

Brederode, Henry, Count of (1531-68), Flem. patriot, b. Brussels. He became a Protestant (c. 1560) and supported the revolt against Philip II's administration. He drew up the document called 'The Compromise,' and his supporters were nicknamed 'Les Gueux' (q.v.) (the Beggars).

Bredon Hill (980 ft), in Worcs, England, capped by Brit. and Rom. earthworks. It is the setting of A. E. Housman's poem *In Summertime on Bredon*.

Bree, Mathias Ignatius van (1773-1839), Flem. artist, b. at Antwerp. He studied at Paris, and in 1804 became director of the Academy of Fine Arts at Antwerp. More notable as a teacher than a painter, he sought to revive the Flem. tradition. Among the younger painters he encouraged were Wappers and De Keyser.

Breech, Breechloader, see GUN.

Breeches Bible, another name for the Geneva Bible (see BIBLE), pub. in 1557 by Eng. fugitives from the Marian persecution 3 years after their arrival in Geneva. It is so called from its trans. of Genesis iii. 7—that Adam and Eve took fig-leaves and made themselves breeches. A sect of Puritan women (following this literally, as was their custom), claimed the right to wear male attire.

Breede, riv. of S. Africa in the SW. of Cape prov. Its source is in the Warm-Bokkeveld, and its direction is SW., then SE. by E., where it enters the sea at Port Beaufort. The bar at the mouth prevents all but small ships from crossing. The B. is navigable for 20 m.

Breeding, in the widest sense of the word, is the production of offspring by any method whatever, and includes the multiplication, by fission and budding, of the simplest organisms, as well as the sexual reproduction of higher animals and plants. It is usual, however, to restrict the use of the term to sexual reproduction, and particularly to that controlled by man for his own purposes. A consideration

of domestic animals, garden flowers, and farm crops will reveal man's interest in, and partial control of, B., and the earliest historical records show his attempts to rear cattle and to improve plants.

Most probably primitive man was nomadic, wandering in search of food, and the duration of the periods he spent in various places would have been largely dependent on the food supply. In the course of time it occurred to him to remove vines that were strangling his food plants and to cut down the undergrowth that prevented ready access to them. As a result of improved conditions the growth of desired plants would be improved. Very early in hist., too, man cleared ground, and cultivated crops, and the seeds of these, through variation and heredity, would develop into plants of differing quality. He cultivated the best of these, and by neglecting the others interfered, by artificial selection, with the process of natural selection.

Such early attempts at cultivation were thus the beginning of selective B. A great advance was made when man first realised that he could improve his crops and his herds by making a selection, not only of the kinds of plants or animals he wished to preserve, but also of the individuals with the most desirable qualities. Most probably such deliberate attempts were first made with animals, and man's criterion of the most suitable individuals was based on visible characters. For instance, Jacob chose the speckled cattle, which were vigorous and prolific, while the brown ones he left to Laban (Gen. xxx. 40). By experience, however, breeders have found that although visible characters may be of considerable use, they are frequently misleading, for they may have arisen as modifications due solely to particular environmental conditions operating on the animal, and may be totally unrepresented in its hereditary constitution. Moreover, it is possible for all the offspring of 2 white birds to be coloured, whereas those of other white birds are always white, so that animals with similar visible characteristics may have very different genetic constitutions. Thus for centuries B. has been carried on by a method of trial and error, but long experience has produced results of a very high standard: horse and cattle B. show the success of these empirical methods.

Unfortunately, however, accompanying this real attainment in B., a body of erroneous beliefs and superstitions has grown up, and even now is not entirely eliminated. Such errors frequently accompany experimental work carried on without knowledge of the underlying principles. One very widespread belief was that of 'maternal impression.' It was thought that the developing embryo could be somatically affected through impressions received through the sense organs of the mother. One of the earliest records of this is that of Jacob placing striped and speckled rods in front of cattle, in the belief that the sight of these markings would, through the mothers,

make an impression on the developing embryos and cause the young animals to have similar markings. 'Maternal impression' was long regarded as the explanation of disfiguring birth-marks and of hare-lip, but the theory is quite unsupported by scientific evidence. On the other hand, the importance of prenatal nutrition is fully recognised and in addition to causing physical harm, shock to the mother may so disturb her metabolism that serious interference with the feeding of the embryo may occur.

Another common belief is that in teleogony, the theory that the characters of the male are, after mating, retained by the female and may appear in the offspring of subsequent matings with other males. For instance, if a white mare were mated with a brown stallion and subsequently with a white stallion, any brown colour appearing in the offspring would be attributed to the first mating. Many experiments have been carried out to confirm this belief and, as a result, it may be stated that there is no justifiable foundation for the theory of teleogony nor of 'male infection' which is the corresponding retention by the male of characters of the female of a previous mating.

The mating of close relatives (inbreeding) has long been regarded as detrimental and the Church has placed certain restrictions on marriages between close relatives. Provided that the original stock is free from hidden defects superior animals can be bred by this method, but investigation is continually revealing so many of these hidden defects that inbreeding is probably best avoided except where inferior or deformed offspring can be discarded. Inbreeding is often practised quite successfully by dog-breeders and other fanciers.

The plant breeder on the whole appears to be free from popular superstition relating to plants, and plant-breeding has now reached a very high standard of perfection. For B. purposes plants have many advantages over animals. In the first place plants are so prolific that a certain amount of waste is relatively unimportant and so plants of doubtful value can be discarded. Many seeds are produced and so very intensive selection of the best can be carried out. However this can be a disadvantage if the methods of choosing the supposedly superior seeds are unreliable. Once a superior variety has been produced the prolific seed production allows rapid multiplication of that variety. As a result of these factors plant-breeding has become a very specialised branch of agriculture and, unlike animal breeding, is rarely carried out by the practising farmer.

In Egypt and China rice has been cultivated for centuries and comparatively early in hist. the importance of the stamen and pistil was recognised. Over 2000 years ago Theophrastus described the pollination of the female flowers of the date palm by natives hanging or shaking over it a branch bearing male flowers. The Chinese are said also to have experimented with hybridisation of flowers, and

much later in hist. the Romans hybridised roses, but the earliest records of systematic attempts were those of the Dutch, who cultivated and produced many new varieties of tulips, primulas, and hyacinths in the 17th cent. Van Mons (1785) at Louvain, by systematic cultivation, produced nearly 500 new varieties of pears in about 40 years. Contemporaneously, Cooper in the U.S.A., Knight in England, and Thaeir in Germany made attempts to improve crops. Thaeir, by his insistence on the value of selection, did much to make agriculture a scientific study. Cooper drew attention to the importance of choosing crops suitable to the soil instead of experimenting with different strains of seed in the hope of getting an improved crop of the same nature as one which had already done badly.

Numerous experiments on wheat B. were made in the 19th cent. with the aim of producing good pure varieties. Hallett made a great advance in his recognition of the fact that the best-looking grain was not necessarily the grain with the best genetic constitution. He therefore tested every grain from an inflorescence, and worked on the theory that the best grain from the best inflorescence would develop into the best plant. From the resultant plants he selected the best, and, by continuing this method for sev. years, was able to show that the method of continuous selection gave little or no increase in yield when applied to pure strains, though with mixed strains the increase was considerable. De Vilmorin worked on similar lines and stressed the importance of testing the progeny before assuming that a strain was pure.

The Irish potato famine of 1847 led to investigations on root crops, and Sutton produced the mangel, marrowfat pea, and a new variety of potato. He also experimented with grass and was able to improve pasturage.

The industrial movements of the 19th cent. gave a great impetus to agriculture. Transport was facilitated, farm machinery invented, and many experiments on cereal cultivation were made in England, America, and Sweden.

One of the best-known breeders of new varieties of plants by hybridisation was Luther Burbank, a Californian nurseryman. Although familiar with Mendel's work (described below) he nevertheless worked largely by rule of thumb, and was able to obtain such novelties as stoneless prunes, white blackberries, thornless cacti, and 'plumcots' (the latter a hybrid between the plum and apricot). These new varieties, like many other cultivated plants, did not 'breed true' and therefore had to be propagated by vegetative means.

So far, as in animal B., all the results had been obtained by empirical methods, but in 1867, Mendel, abbot of Brunn, working with the edible pea, made the first quantitative systematic experiments on B., and as a result was able to formulate definite laws of heredity (see MENDELISM and HEREDITY). His work remained practically unknown until after Correns, Tschermak, and de Vries, all working

independently, rediscovered these laws in the early 20th cent. Since that time extensive research has been done, both on plants and animals, in an attempt to discover whether Mendel's laws are universally applicable. Results show that, while in certain cases the laws enable the breeder to forecast his results with a high degree of accuracy, in other cases discrepancies occur, so that the best results can be obtained only by a combination of theory and practice.

Some of the very qualities that formerly retarded progress in plant B. have been those of greatest use in enabling the geneticist to determine the ultimate units of genetic constitution of his plants. The large number of seeds produced by a single plant will, given the same suitable environment, grow into plants with a number of differences due to the different associations of groups of unit characters. This may be seen by referring again to Mendel's hybrid peas obtained by crossing tall plants having green cotyledons with short plants having yellow cotyledons. The seeds of the self-fertilised hybrids developed into 4 different types of plant—all plants with either green or yellow seed leaves and short plants with seed leaves of either colour. The sweet pea has 7 different groups of characters, and these may be associated in 128 ways, without including any possible cross-overs. The higher animals usually have more than 7 groups, and since most animals used in B. have comparatively small numbers of offspring, it is obvious that the whole of the breeder's lifetime would be too short to discover the complete genetic constitution of an animal. Moreover, he probably will not be interested in trying to do so, but will confine his attentions to the characters which he is trying to secure.

For these reasons the theory of B. has advanced beyond its practice, but increasing application of it is being made in agriculture and in horticulture. Plant B. is now estab. on a scientific basis, and theory combined with knowledge gained by experimental work enables the plant-breeder to obtain many of his results with mathematical precision. Although theory cannot be applied to the B. of animals with the same certainty with which it may be applied in many cases to that of plants, it can help the dealer in his selection of material and in the elimination of certain error, particularly that involved in trying to breed animals for characters which are not ultimate units of genetic constitution. Thus when a breeder wishes to raise a 'hardy' stock or a eugenist to secure an 'intelligent' race, the first consideration should be to determine, if possible, the characters which constitute 'hardiness' and 'intelligence.' The best results in B. will always be obtained by the intelligent application of theory to practice. See also BIOLOGY; HEREDITY; MENDELISM. See W. Bateson, *Mendel's Principles of Heredity*, 1902; P. H. Morgan, *The Theory of the Gene*, 1928; C. D. Darling, *Chromosomes and Plant Breeding*, 1932; C. H. Waddington, *An*

Introduction to Modern Genetics, 1939; E. B. Ford, *Mendelism and Evolution*, 1940; J. E. Nichols, *Livestock Improvement in Relation to Heredity and Environment*, 1945; W. J. C. Lawrence, *Practical Plant Breeding*, 1946; J. Y. Beatty, *Plant Breeding*, 1954; L. W. Winters, *Animal Breeding*, 1954.

Breezes, Land and Sea, local winds, unconnected with the main movement of air, caused by differences in the heating of land and sea. In hot climates they blow regularly, and extend a considerable distance, except when they are overpowered by more violent winds, as, for example, the monsoons. In England they are irregular. It is a matter of common observation that about noon a breeze usually begins to blow landwards from the sea, and continues in that direction till sunset, whereas near midnight this breeze is superseded by one blowing in exactly the contrary direction, that is, from the shore seawards. The following is the usually accepted explanation: The heat of the sun causes the air over the earth to expand, and therefore to rise. This upper stratum passes away towards the sea, and thus increases the barometric pressure. This causes a current of air to flow continually towards the coast, where the pressure is lower. When the land breeze sets in at night, it is to be explained by similar reasoning. This time the atmosphere over the land is cooled, and the heated strata above contract and therefore fall. The cooling takes place much more rapidly over the land than over the sea. Therefore the colder heavier air rushes out to sea to relieve the higher pressure. See METEOROLOGY.

Bregenz (Rom. Brigantium), Austrian tn, cap. of the prov. of Vorarlberg, at the E. end of the Lake of Constance (q.v.). Part of the 13th-cent. walls remain, and the par. church is partly 11th cent. It is a tourist resort, has a trade in agric. produce, and has iron and wood industries. Pop. 20,300.

Bremsstrahlung, see X-RAYS.

Brehon Laws, Eng. name for the laws that prevailed in Ireland till the middle of the 17th cent. The correct name for the laws is the *Feinechus*, meaning the laws of the *Feine* or farmers. The appellation B. is derived from the Gaelic word *breitheamh*, meaning a trained judge, who administered justice to the tribe. Fragments of transcripts of these laws are preserved in Trinity College, the Royal Irish Academy, the Brit. Museum, and the Bodleian. These fragments are a store-house of archaeological and philological treasures. The transcripts belong mainly to the 14th cent., but the laws themselves go back as far as to the 3rd cent. (the reign of Cormac Mac Art). The language of the B. L. is the *Bearla Feini*—the most archaic form of the Gaelic language. The vocabulary is often hard to interpret owing to the lack of contemporary documents. The Brehon expounded the law at the public assemblies of the tribes. If there were sev. Brehons in the dist. the suitor chose his own

Brehon. An appeal to the assembly was permitted against the decision of the Brehon, and if he were found to have given a false decision he was liable to a severe penalty. The Brehon had to study the laws for a course lasting about 20 years before he expounded them. The society among which the B. L. prevailed was based on the clan. These clans were under prov. kings, but these prov. kings swore allegiance and paid tribute to the Ard-Rí or supreme King of Ireland. The land occupied by a clan was the collective property of the clan, but part of the land was reserved for the king, nobles, and other public servants. The remainder of the land was allotted on the tithe system to the people. The laws recognised 2 classes of crimes—crimes against the state and crimes against the individual. Crimes of the first class, e.g. treason, were punished with the severest penalties, i.e. banishment and loss of property. The offenders of the second class had to give compensation in proportion to the crime. The B. L. were the guardians of the entire social life of ancient Ireland.

Breidfjörð, Sigurdur (1798–1848), Icelandic poet, the greatest of all the *rímur* (q.v.) poets and among the best loved. His *Núma rímur*, composed in Greenland in 1831–4, based on Florian's novel, *Numa Pompilius*, is one of the masterpieces of Iceland's 19th-cent. literature. See Sir Wm Craigie, *Specimens of Icelandic Rímur*, vol. III, 1952.

Breilsach, Ger. tn in the *Land* of Baden-Württemberg (q.v.), on a hill overlooking the Rhine (q.v.), 80 m. SW. of Stuttgart (q.v.). It has been a fortified position since Rom. times, and in the Middle Ages was an important Ger. stronghold. Opposite it, in France, on the other side of the riv. is the counter-fortress of Neuf-Brisach, built by Louis XIV. Pop. 3000. See BREISGAU.

Breisgau, dist. in Germany in Baden-Württemberg (q.v.), on the Rhine (q.v.). It contains the S. part of the Black Forest (q.v.), and its chief tns are Freiburg and Breisach (qq.v.).

Breitenfeld, dist. of Germany, NW. of Leipzig (q.v.). Two battles were won here by the Swedes during the Thirty Years War (q.v.). It was also the scene of part of the battle of Leipzig in 1913.

Breitinger, Johann Jakob (1701–76), Swiss scholar and writer, b. Zürich, where he became prof. of Greek and Hebrew. His critical works had a great reforming influence upon Ger. literature. In this effort he was associated with Bodmer, and took part in the controversy with Gottsched. His writings include *Kritische Dichtkunst*, a critique on the art of poetry, 1740. See J. W. Eaton, *Bodmer and Breitinger, and European Literary Theory*, 1941.

Breikopf, Bernhard Christoph (1695–1777), Ger. printer and publisher. In 1719 he founded the music-publishing firm B. and Härtel at Leipzig, which became famous for its eds. of the classics. B. and Härtel also encouraged new composers. The house was destroyed by

bombs in 1943 and in 1945 the firm moved to Wiesbaden. The remains of the old firm at Leipzig were expropriated by the Communist Gov. in 1951, but the Leipzig tradition lives on at Wiesbaden.

Breikopf, Johann Gottlob Immanuel (1719–94), Ger. typographer, b. Leipzig, and educ. at the univ. there. He entered his father's printing and publishing business (to which he succeeded in 1745), and introduced many valuable typographical improvements, obtaining clearer and more elegant letters than had hitherto been known. B. invented a new method of printing music and one for printing maps with movable types. He wrote sev. books on the art, and began a *History of the Art of Printing* (pub. 1779). His second son, Christoph Gottlob B., after carrying on the business for a year, gave it up (1795) to his friend Härtel.

Breitscheid, Rudolf (1874–c. 1945), Ger. politician and writer, b. Cologne; educ. at the univs. of Munich and Marburg. He became a Socialist, and from Nov. 1918 till Jan. 1919 he was Prussian minister of the interior. He was elected to the Reichstag in 1920 and until 1933 was the Socialist party's expert on foreign affairs. On Hitler's rise to power he went into exile, and was in the Fr. unoccupied zone at the time of the Bordeaux armistice (1940), but was handed over by the Vichy Gov. to the Gestapo and d. in Buchenwald concentration camp sometime later.

Brema, Marie (1856–1925), operatic singer, b. Liverpool of Ger.-Amer. parents, her real name being Minny Fehrman and her married name Braun. She studied under George Henschel and sang at concerts. Her first appearance was at a popular concert in London in 1891, and the same year she appeared as Orpheus in Gluck's work, her great operatic part. In 1894 she made a successful appearance at Bayreuth. Afterwards sang in most of the prin. opera houses of the European caps. and at Covent Garden, her chief parts being Wagnerian, especially Brünnhilde and Kundry. On retiring from opera she taught in the Manchester College of Music.

Bremen: 1. *Land* of NW. Germany, in the Federal Rep., consisting of 2 enclaves in the *Land* of Lower Saxony (q.v.): one centres on the city of B. and the other on the tns of Bremerhaven and Wesermünde (qq.v.). Area 158 sq. m.; pop. 628,800.

2. Ger. city and port, cap. of the *Land* of B., on the Lower Weser (q.v.). It first rose to be a tn of importance when Charlemagne (q.v.) made it the seat of a bishopric. It attained prosperity through commerce, and it became in time one of the chief tns of the Hanseatic League (q.v.). In 1646 it became a free city of the empire. During the wars of Napoleon (q.v.) it passed into the hands of the French, but it regained its independence in 1813. It joined the N. Ger. Confederation (q.v.) in 1867, and eventually became part of the new Ger. empire. During the First World War its trade suffered severely, but after the war it recovered much of its former prosperity as an

industrial and maritime centre in touch with the prin. markets of the world, conducting in particular an important trade with the U.S.A. in tobacco, cotton, and petroleum. Its harbour cleared some 10,000,000 tons of shipping annually, two-thirds of which was sea-going. During the Second World War the city was severely bombed by the Allies, notably in Oct.-Dec. 1944. Although trade was at a standstill, the dockyards were active throughout the war, and were the centre of construction of U-boats (see SUBMARINE) of the largest type, of which over 1200 were launched. Himmeler (q.v.) made B. his H.Q. in April 1945 to organise the final resistance of the S.S. The city fell to the Brit. Second Army, 23-8 April. At the end of the war large parts of the city were in ruins, but there has since been a great deal of reconstruction. B. is divided by the riv. into 2 parts: the Altstadt (old tn) on the r. b., with narrow, winding streets and irregular houses; and the Neustadt (new tn) on the l. b. The 11th-cent cathedral of St Peter stands on the site of an 8th-cent. wooden structure. The beautiful Rathaus, Gothic with a Renaissance façade, survived the war, as did the fine Schütting guild-house. The harbours, which have no locks, have a depth of 32 ft. and are again busy; sev. of the great shipping lines, including N. Ger. Lloyd, have their head offices in the city, which is the second port of the country. In addition to shipbuilding, there are automobile, tobacco, brewing, coffee, and chocolate industries. Pop. 499,900.

'Bremen', The name of a N. Ger. Lloyd liner, built in 1929. Quadruple screw, turbine-driven, and of a 51,731 gross tonnage. She is 898 ft in length and 101 ft in breadth, with a speed of 28 knots. In July 1929 the B. made the Atlantic crossing in 4 days 18 hrs 17 min. from Europe to New York, thereby beating the record of the *Mauretania*. Shortly after the outbreak of the Second World War the ship endeavoured vainly to get back from America to Germany. She eventually found refuge in a Russian port. See also ATLANTIC PASSAGE RECORDS.

Bremer, Fredrika (1801-65), Swedish novelist, b. Tuorla near Åbo, Finland. Her studies seriously affected her constitution, and at the age of 20 she travelled with her family, for the sake of her health. In 1828 the first vol. of *Sketches of Everyday Life* were pub., but the second vol., containing *The H. Family*, was the work that brought her international fame. Her father, a wealthy iron merchant, d. in 1830, and from that time she travelled and wrote as she pleased. She studied family life in the old and new worlds, and her books, entitled *The Neighbours*, 1837, *Homes of the New World*, 1853, and *Life in the Old World*, 1862, are the fruit of her researches. Her prin. works were trans. into English by Mary Howitt (11 vols., 1844-5). On her return to Sweden she became absorbed in questions of social reform, especially the emancipation of women, and her later works are concerned with her views on those topics. They include *Hertha*, 1856,

and *Father and Daughter*, 1858. See E. Klemm, *F. Bremer*, 1925.

Bremerhaven, Ger. port in the *Land of Bremen* (q.v.), 32 m. N. by W. of Bremen city, for which it is the out-port. It is on the N. Sea, on the E. bank of the Weser (q.v.) estuary, and has 11 harbour basins, ship-building and repair yards, and important fisheries. Pop. 129,000.

Brendan, or Brandon, St (c. 485-c. 583), b. Tralee in Kerry. The historical personage of this name seems to have been abbot of Clonfert; but according to medieval legend he sailed across the Atlantic in search of a 'promised land,' and was the hero of countless adventures. Geographers long accepted St B.'s Is. as a geographical reality, and in the maps previous to Columbus's voyage it is located near the mythical Is. of Antilla (or Antiglia). Columbus in his jour. says he had heard reports about the situation of the Is. It was variously located by geographers until in 1759 the legend was exploded and the reported discoveries were explained as mirage. There are many versions of this voyage, perhaps the most popular legend of medieval times; the oldest version is the *Navigatio Brendani* of the 11th cent. His feast is on 16 May.

Brendon Hills, range of limestone hills in W. Somerset, England, lying some 6 m. S. of Watchet. They average nearly 1400 ft in height.

Brennan, C. J., see AUSTRALIAN LITERATURE.

Brennan, Louis (1852-1932), Irish inventor, b. Castlebar, co. Mayo. He resided in Melbourne, Australia, from 1861 till 1880. In 1882 his torpedo, controlled by wires unwound from the shore, was adopted by the Brit. Gov. for harbour defence; and B. was superintendent of the Gov. B. Torpedo Factory, 1887-96; consulting engineer of the same, 1896-1907. Made C.B., 1892. From 1896 to 1912 he made mono-rail experiments; in 1907 he gave a successful exhibition before the Royal Society.

Brenner Pass, pass on the Austro-It. border in Tirol (q.v.), on the road between Innsbruck and Bolzano (q.v.). The gate of Italy on the N., it is the lowest pass in the main Alps (4500 ft), and is always open. L. Septimius Severus (q.v.) built a road here. There is now a motor road and a railway. During the operations on the W. front in the Second World War the U.S. 7th Army estab. contact with the allied forces in Italy at the B. P. in May 1945 (see WESTERN FRONT IN SECOND WORLD WAR).

Brennibor, see BRANDENBURG.

Brennus, used as the name, although probably actually the title, of 2 chieftains of the Celts of Gaul. The first B. led the Gaulish tribes in an attack upon Rome. In 390 bc he defeated and practically annihilated a large Rom. army, and marched on Rome. The city, defended only by the aged senators, was easily captured, but the Capitol sustained a 2-month siege, being once saved only by the geese of the Capitol. The Gauls at last consented to a ransom of 1000 pounds of gold. Whilst the gold was being

weighed, the Romans complained of some unfairness, and B. immediately threw his sword into the opposite scale, exclaiming, 'Vae Victis' (woe to the vanquished). The second B. is said to have led 2 expeditions of the Gauls into Macedonia and Thrace. In the second (280 BC) the Gauls advanced on Delphi, but they were beaten back by the determined resistance of the citizens. Rather than return defeated B. committed suicide.

Brent Goose (*Branta bernicla*), bird of the family Anatidae, closely related to the barnacle goose. In colour it is black, white, and grey, and it commonly frequents Brit. coasts. It is both carnivorous and herbivorous, and is an edible species of goose.

Brenta, lt. riv. which rises in a lake at Levico (q.v.) and flows generally E. and then SE. to the Adriatic near Chioggia (q.v.). Part of the old bed of the riv. has been canalized. Length 106 m.

Brentano, Clemens (1778-1842), Ger. poet and romance writer, b. Ehrenbreitstein, the brother of Bettina von Arnim, Goethe's friend. He was of a restless, unsettled temperament, and subject to melancholia. He studied for some time at Jena, but subsequently went to Heidelberg and afterwards to Berlin. In the year 1818 he became a zealous Catholic and renounced his former unsettled habits. For 6 years (1818-24) he lived in seclusion in the monastery of Dülmen, where the 'nun of Dülmen' revealed herself to him. Towards the end of his life his melancholia developed to a critical pitch. He d. at Aschaffenburg. B.'s poems are of a somewhat extravagant romantic type. Symbolism and occult expression are carried to excess. He pub. his *Satiren und poetische Spiele* in 1800, and *Godwi* (a romance) in 1802. His dramatic works show considerable power; the best are *Victoria*, 1817 and *Die Gründung Prags*, 1815. His short novels were popular; *Geschichte vom braven Kasperl und dem schönen Annerl*, 1817, is one of the finest things he ever wrote. His *Romansen vom Rosenkranz* was pub. after his death and contains some of his best work. B. also collaborated with Achim von Arnim in the collection of the tales and poems forming *Des Knaben Wunderhorn*, 1806-1808. B. was perhaps the greatest genius of the Ger. *Romantik*, but all his major works remained incomplete. See his Letters, ed. F. Seebass (2 vols.), 1951, and lives by R. Guignard, 1933, I. Seidel, 1944, and W. Pfeiffer-Belli, 1947. See also K. Glockner, *Brentano als Märchenerzähler*, 1937.

Brentano, Heinrich von (1904-), Ger. politician and lawyer, educ. at Giessen Univ. He became prominent in Ger. politics after the Second World War, being a Christian Democrat member of the Federal Parliament at Bonn from 1949. He became foreign minister in Adenauer's gov. in 1955. B. has done much to further the cause of European unity, and of Federal Ger. alliance with the W. He has been especially prominent in the affairs of the Council of Europe.

Brentano, Ludwig Joseph (corrupted

into Lujó) (1844-1931), Ger. political economist, b. Aschaffenburg, in Bavaria. He belonged to the same family as the poet Clemens of the same name. He studied at Dublin Univ. and also at sev. Ger. univs. In 1868 he travelled in England to study the conditions of labour and examine Eng. trade unionism. The fruit of these researches was his prin. work, *Die Arbeitergilden der Gegenwart*, 1872. The work traces the evolution of the trade union from the guilds of the Middle Ages. He became a prof. of political economy at Breslau in 1872, at Strasburg in 1882, at Vienna in 1888, at Leipzig in 1889, and at Munich in 1891. His other works include treatises on wages, on insurance for working classes, and on socialism. His later books are *Ist das 'System Brentano' zusammengebrochen?*, 1915, *Die Urheber des Weltkriegs*, 1922, *Der wirtschaftende Mensch in der Geschichte*, 1923, and *Eine Geschichte der wirtschaftlichen Entwicklung Englands*, 1927-8. He d. in Munich.

Brentford, William Joynton-Hicks, 1st Viscount, of Newick, Sussex (1865-1932), politician and lawyer. In 1908 he became Conservative M.P. for NW. Manchester, defeating Winston Churchill. He was defeated there early in 1910, but elected next year for Brentford. In 1918 he changed to Twickenham, which he represented until the dissolution of 1929. He was made a baronet, Sept. 1919, and was one of those Conservatives who disapproved of continuing the Coalition. Under Bonar Law in 1922 he became parl. secretary to the overseas trade dept; in 1923 postmaster-general and paymaster-general; and then financial secretary to the Treasury, with a seat in the Cabinet—being sworn of the Privy Council 27 Mar. 1923. Under Baldwin he was minister of health until Jan. 1924; and in the second Baldwin ministry, 1924-9, home secretary. He became Viscount B. at the dissolution 1929. He was a leading Evangelical, president of the National Church League, and was prominent in securing the defeat of the Alternative Prayer Book measure in 1928. He wrote books on motor law, censorship of morals, and the prayer book. See life by H. A. Taylor, 1932.

Brentford, Middlesex, England, on the N. bank of the Thames, near the W. boundary of London, forms part of the municipal bor. of B. and Chiswick, and is generally considered the co. tn. Caesar's crossing of the Thames in 54 BC is considered by most authorities to have been at B. In 1642 Charles I.'s forces captured B. after the battle of Edgehill, but found the way to London barred by superior parl. forces. The industries of B. include the manuf. of soap, cosmetics, and pharmaceutical products, and light engineering. The Grand Union Canal joins the R. Thames at B., which has extensive docks for inland water transport and good road and rail communications. There is a daily fruit and vegetable wholesale market. B. and Chiswick return one member to Parliament. Pop. (with Chiswick) 59,200.

Brentidae, family of coleopterous

insects which includes many tropical beetles; the chief genus is *Brenthus*. The most common colouring of the species is black, or brown, with red spots and markings. They live on plants, and the females bore into wood with their sharp mandibles.

Brenton, Sir Jahleel (1770-1844), Brit. admiral, *b.* in Rhode Is. Belonged to a loyalist family which lost most of its property in the insurrection of the Amer. colonies. He was lieutenant in the Brit. Navy at beginning of the war, and emigrated to England with his family. He went to sea (1781) with his father, and to the (Chelsea 'maritime school' on the return of peace. For a time B. served in the Swedish Navy against the Russians. He was at Cape St Vincent, in the *Barfleur*, 1797. In 1801 he served as flag-captain to Saumarez in actions at Algeciras and Gibraltar. B. was wrecked off Cherbourg, 1803, and joined by his wife in prison. Exchanged (1806) for Masséna's nephew captured at Trafalgar. His most brilliant achievement was his defeat of the Franco-Neapolitan flotilla, 1810. He was made baronet, 1812; K.C.B., 1815. B. reached flag rank, 1830, and took part in philanthropic work. He was resident commissioner at the Cape, and Lieutenant-governor of Greenwich Hospital, 1840. See Raikes's life, 1846.

Brentwood, mkt tn in Essex, England, situated in pleasant, well-wooded country, about 9 m. from Chelmsford. There is a large and important grammar school, which was founded in 1557 by Sir Anthony Browne, and dedicated to St Thomas à Becket. Pop. 31,000.

Brenz, Johann (1499-1570), Lutheran reformer, *b.* Weill, Württemberg; as a student at Heidelberg he heard Luther speak, and became a staunch adherent of the Reformation party. His *Syngramma Suevicum* expounds Luther's doctrine of the eucharist. Although a zealous reformer, he opposed persecution and openly disapproved of such methods in his *De Haereticis, an sint persequendi*, 1554. He co-operated in the Württemberg Confession of Faith, and his catechism was second only to Luther's.

Brescia: 1. Prov. of Italy, in central Lombardy (q.v.). Its N. half is in the Alps (q.v.), and the S. half is a plain watered by the Mella and Chiese, tribs. of the Oglio (see Po). The prov. contains the E. shore of Lake Iseo and the W. shore of Lake Garda (qq.v.). The prin. tns include B. and Chiari. Area 1870 sq. m.; pop. 870,000.

2. (anc. Brixia), It. city, cap. of the prov. of B., on the Mella, 51 m. E. of Milan (q.v.). It is dominated by an anc. castle, and has 2 cathedrals, of which the old is medieval, and the new, which has a baroque façade, dates from 1604. There are many other fine old churches and palaces, some of which sustained severe damage during the Second World War. The churches, and the picture gallery, contain notable collections of paintings, including works by Raphael, Tintoretto, and Moroni (q.v.). The marble temple of Vespasian, the chief of the numerous

Rom. remains in the tn, is now used as a museum of antiquities. B. is well known for its cutlery and fire-arms, and it has also silk, woollen, leather, paper, iron, and wine manufs. Arnold da B. (q.v.) was *b.* here. Pop. 147,000.

Breshko - Breshkovskaya, Yekaterina Konstantinovna (1844-1934), Russian revolutionary of aristocratic Polish origin, nicknamed the Grandmother of the Russian Revolution. She spent many years in prison, banishment, and underground work. Belonged to the party of Socialist Revolutionaries (q.v.). After the Bolshevik seizure of power she emigrated and lived in Prague.

Breslau, see WROCLAW.
'Breslau', see 'GOEBEN' AND 'BRESLAU'.
Bressanone (Ger. Brixen), It. tn, in Trentino-Alto Adige (q.v.), at the confluence of the Isarco and the Rienza. It is on a road to the Brenner Pass (q.v.) at the N. foot of the Dolomites (q.v.). From 1179 to 1803 it was the cap. of an eccles. principality of the Holy Rom. Empire. The cathedral and bishop's palace date from the 13th cent. Pop. (tn) 5900; (com.) 12,900.

Bressay, is., 6 m. long and about 2½ m. wide, belonging to the Shetland group, off the N. Scottish coast, situated E. of Mainland (q.v.). Its coast is bold and rocky; peat moss largely covers the interior. Shetland ponies are bred on the is. Pop. 450.

Bresse, anc. dist. of France, once part of Burgundy (q.v.), situated E. of the Saône. Bourg (q.v.) was the cap.

Bressuire, Fr. tn, cap. of an arron., in the dept of Deux-Sèvres. It has the ruins of an anc. castle. There are markets and a textile industry. Pop. 6100.

Brest, seaport in the dept of Finistère, France, situated on an immense roadstead, the only entrance to which is by a narrow channel. The place is thus a natural fortress, and has been strongly fortified since the time of Richelieu. Some of the old defences are the work of the great military engineer Vauban (q.v.). B. is built on the slopes of 2 hills, intersecting which is the R. Penfeld. It has 2 harbours, one for naval and one for mercantile shipping. There are shipbuilding yards, an arsenal, barracks, stores, and all the other features of an important naval station. B. has a naval academy, and sev. schools of nautical science. There are some manufs. such as chemicals and paper. Historically B. was a frequent cause of dispute between France and England. It was held by the English on 2 occasions before the incorporation of Brittany with France in 1532. During the Second World War the Germans used B. as a U-boat base, and for a time as a harbour for the battleships *Scharnhorst*, *Gneisenau*, and *Prinz Eugen*. B. was consequently subjected to heavy allied air attack. After the allied landing in France in 1944, the city was under siege for a period of 6 weeks (Aug.-Sept.), and when the Ger. garrison finally capitulated no building in the city had escaped damage and most had been destroyed. Pop. 91,400.

Brest: 1. Oblast in SW. Belorussia, situated largely in the Poles'ye (q.v.) and covered with mixed forests and marshes. It has large salt deposits. Pop. 1,194,000, mostly Belorussians (until the 1939-45 war also Jews and Poles). Industries include lumbering, grain growing, and hog raising. The prin. tns are B., Pinsk, and Baranovich.

2. (formerly **Brest-Litovsk**, Polish **Brześć nad Bugiem**) Cap. and economic and cultural centre of the above, on the R. Bug. It is an important transportation centre (5 railway lines, Dnioper-Bug canal). Pop. (1931) 48,000 (1910, 57,000). It has been known since 1017 as a fort. tu; in 1319 it became Lithuanian, in 1569 Polish, in 1795 Russian, and from 1919 to 1939 again Polish. It was the meeting-place in 1319 of the council which estab. the United Catholic Church. Since the 1830's it has been an important fortress, and it saw much fighting in both world wars. The peace treaty between Soviet Russia and Germany was signed here in 1918.

Brest-Litovsk, Treaty of, treaty which ended the war between Germany and Russia in 1918. In Nov. 1917 the Bolshevik revolution broke out, resulting in the formation of the Soviet Gov. with Lenin in control. An armistice was concluded with Germany early in Dec., and peace negotiations were begun at the H.Q. of Prince Leopold of Bavaria at B.-L. The treaty was signed on 3 Mar. 1918. The chief terms of this treaty were: (1) All mutual agitation and propaganda to cease; (2) Soviet Russia agreed to renounce control of certain ters. which formerly belonged to Tsarist Russia; (3) Germany to evacuate certain parts of Russia then occupied; (4) Russia to evacuate the E. Anatolian provs. of Turkey; the dists. of Kars, Ardahan, and Batum, and Estonia, Livonia, Finland, and the Aaland Is.; (5) Russia to demobilise her army completely and keep all warships within her harbours; (6) Russia to recognise the treaty of peace concluded by the Central Powers and Ukrainian People's Rep.; (7) Persia and Afghanistan to be respected as free and independent states; (8) Mutual renunciation of payment of war costs. Article XII of the treaty provided for the conclusion of other treaties, e.g. a supplementary treaty signed at B.-L. on 3 Mar. 1918, which dealt with the estab. of public and private legal relationships between Germany and Russia, the exchange of prisoners of war and interned civilians, and the treatment of merchant shipping. A commercial treaty between Germany and Russia was also concluded. Under the 'Ger.-Russian Financial Agreement,' Russia agreed to pay to Germany, under Article II, 6 milliards of marks as compensation to Germans 'who shall have suffered damage by reason of Russian measures.' This was signed by the peace delegates of both parties on 27 Aug. 1918.

The military situation created by the conclusion of the treaty of B.-L. did not prove so favourable to Germany as she had calculated. The Russian frontier

could not be left unguarded, as it was fully expected that independent hordes of Russians would make serious raids across the border in spite of the terms of the treaty. A Ger. force had also to be kept in Finland as a threat to Petrograd (now Leningrad) should Russia fall under the influence of the Entente and be induced to resume operations against Germany. The Rumanian army had been demobilised, but it had not been disarmed, and the Germans found that at least 4 divs. were required in that part of Europe. It was, however, too late for Germany to alter her plans for a supreme effort on the W. front, before the Entente forces were reinforced by the Americans. The protracted peace negotiations at B.-L. caused Germany to lose valuable time, and thus nullified the effect on the operations of the troops she was able to transfer to the W. front as a result of the conclusion of the treaty. This treaty was recalled, ironically enough, in Sept. 1939, after the Ger. invasion of Poland, when the Soviet armies marched into that country and Stalin's representatives met those of Hitler, at B.-L., to partition Poland between them.

Bretagne, see BRITANNY.

Brethren, Church of, the majority group of Ger. Baptist B., called from their practice of immersion 'Dunkers,' 'Dunkards,' 'Tunkers,' or 'Dippers,' with 1035 churches and 194,000 members in 1955. The sect was founded at Schwarzenau, Germany, in 1708 by Alexander Mack. Under persecution its members emigrated between 1719 and 1739 to the vicinity of Germantown, Pennsylvania. Their creed is strictly evangelical, and they enforce baptism by immersion, and only for adults. They practise extreme plainness of dress, 'washing of feet,' 'salutation with a holy kiss,' faith-healing, avoid war and litigation, and refuse to take oaths. The Church is represented throughout the U.S.A. except New England, maintains missions in Asia and Africa, has 8 colleges, a publishing house at Elgin, Illinois, and a Church paper, the *Gospel Messenger*.

Brethren, Plymouth, see PLYMOUTH BRETHREN.

Brethren of Common Life, community estab. by Gerard Groot about the year 1380, which included at one time the famous Thomas à Kempis (q.v.). Many of them were laymen. The Brethren were free to remain as long as they liked, or to depart when they liked; but as long as they remained Brethren, they were bound by their vows of chastity, poverty, and obedience. Their money went to a common fund, and they spent their lives among the people, converting and teaching them. They were bitterly attacked from inside the Church, but triumphed over their enemies at the council of Constance. In the 16th cent. they began to decline, and died out in the 17th. They are sometimes called the Brethren of Modern Devotion. Similar to them in some ways are the Bèguines in Belgium and the modern Lay Associations created in the Rom. Catholic Church under Pius XII.

Brethren of Mercy, see MISERICORDIA.

Brethren of the Free Spirit, sect of mystical pantheists who appeared during the 13th cent. They were really the outcome of the revival of the Aristotelian movement influenced by Neo-Platonism. They were bitterly attacked by the orthodox; council after council condemned their works, but they continued to exist until the 16th cent.

Bretigny, Fr. vil. in the dept. of Eure-et-Loir, 20 m. S. of Paris. By the treaty signed here in 1360, Edward III (q.v.) renounced his claim to the Fr. crown, receiving the SW. quarter of France as a sovereign prince. John II of France (q.v.) was liberated pending the payment of a ransom of 3,000,000 crowns.

Breton, Jules Adolphe (1827-1906), Fr. painter, b. at Courrières, Pas-de-Calais. He studied art under de Vigne at Ghent, under Wappers at Antwerp, and under Drölling at Paris. His first pictures were historical in character, and include 'Saint Plat Preaching in Gaul' and 'Misery and Despair'—a scene of the revolution of 1848. B., however, saw that his talent lay in interpreting rural life. In 1853 he exhibited his 'Return of the Harvesters' in the Salon at Paris, and the 'Little Gleaner' at Brussels.

Breton, Nicholas (c. 1545-c. 1626), poet and satirist, son of a London merchant. Apparently at Oxford in 1577, he was for some time in the Low Countries. From 1592 he enjoyed the patronage of the Countess of Pembroke. A very versatile writer, he produced many poetical works, including *A Floorish upon Fancie*, 1577, *The Soul's Heavenly Exercise*, 1601, *The Passionate Shepherd*, 1604, and *Pasquill's Mad-cappe*, 1626. His lyrics, 8 of which appear in *England's Helicon*, show both skill and delicacy. In prose he wrote *Wit's Trenchamour*, 1597, *The Wit of Wit*, 1599, *A Mad World, My Masters*, 1603, *Adventures of Two Excellent Princes*, 1604, *Grinello's Fortunes*, 1604, and *Strange News out of Divers Countries*, 1622. His mother married George Gascoigne (q.v.). His works were ed. by A. B. Grosart, 1879.

Bretón de los Herreros, Manuel (1796-1873), Sp. dramatist, b. Quel, Logroño. He occupied sev. gov. offices, became director of the National Library and secretary of the Royal Academy. He wrote about 160 original plays, and many trams. His genius lay chiefly in comic power and witty social satire. *Muñeca y verdades*, 1837, and *Escuela de Matrimonio*, 1852, are classics.

Breton Island, Cape, see CAPE BRETON ISLAND.

Breton Language and Literature. The B. language (also known as Armorican), spoken in Lower Brittany by about 1 million inhab (who are mainly bilingual), belongs with Welsh and Cornish (now extinct) to the Brythonic or P-Celtic group of the Celtic languages (q.v.). Contrary to the common belief there was no direct connection between the B. language and the ancient Celtic language of pre-Rom. Gaul, which was already extinguished before the B. settlers

arrived from Britain, refugees from the A.-S. invasion in the 5th and 6th cents. There are 4 main B. dialects: *léonard* (in the dist. of Léon, Finistère) which gives the official orthography; *cornouaillais* (in the dist. of Cornouaille, also Finistère); *trégorois* (in the dist. of Tréguier, Côtes-du-Nord); and *vannetais* (in the dist. of Vannes, Morbihan). B. literature may be subdivided into 4 periods: (1) Early B., 8th-11th cent.; glosses and names in auct. documents (see J. Loth, *Vocabulaire Vieux-Breton*, 1884, and *Chrestomathie Bretonne*, 1890). (2) Middle B., 11th-19th cent.: very scarce literary material before the late 15th cent.; then, religious dramas or mystery plays (*Le Mystère de Sainte-Nonne*, late 15th cent.; *Le Grand Mystère de Jésus*, 1530; *Le Mystère de Sainte Barbe*, 1557), poems (*Passing of Mary, Life of Man*, etc.), but also secular books (such as *Catholicon* of Lagadouc, a B.-Lat.-Fr. dictionary printed in 1499: the first printed B. book). (3) Modern B.: begins in 1659 with Julien Mannoir's grammar, *Le Sacré Collège de Jésus*, in which a phonetic system replaces the traditional orthography; mystery and miracle plays, drawing on the O.T. (*Creation ar bed; Vie de David*) and the N.T. (*Rue santes Anna; La Passion*), lives of saints (*St David; St Guennolé*), and chivalry literature (*Vie des quatre fils*). (4) 19th-cent. Renaissance: editors of ancient poems, legends, folk-tales, and ballads (Hersart Viscomte de la Villamarqué, 1815-95; August Brizeux, 1803-58), lexicographers and translators (such as Le Gonidec and Troude), poets and writers (F. G. M. Luzel, Prosper Proux, P. D. Goebriand, Abbé Guillome, Anatole le Braz, A. le Moal, Erwan Berthou, C. M. de Prat, V. Guillaud, N. Quellen, and others) have endeavoured to create a national literature. One of the most representative works of the modern movement is *An Delen Dir* ('The Harp of Steel'), by Fanch Jaffrennou, 1900. B. genius is best expressed in the oral literature of the ancient bards and storytellers. Characteristic are the *gwezennoù* or *complaints* (dealing with local history, petty crimes, religious legends, superstitions, dramatic in composition, but concise in style) and *sonioù* (love songs, influenced by Fr. literature. Gwosnon, Taliez or Taleisin, Mezzin, or Merlin, and Sullo can still be recognised in the popular traditions, which are saturated with the marvellous, the supernatural, the ideal, with stories of adventure and of the sea.

Bretschneider, Heinrich Gottfried von (1739-1810), Ger. satirist, b. Gera. He attended the Moravian Institute at Elbersdorf and the gymnasium at Gera. In 1778 he obtained the office of librarian at the univ. of Buda, and in 1782 a gov. appointment. His best satires are *Almanach der Heiligen auf das Jahr*, 1788, and *Georg Wallers Leben und Sitten*, 1793.

Bretschneider, Karl Gottlieb (1776-848), Ger. theologian, b. Gersdorf, Saxony; studied theology at Leipzig, and the keenness of his intellect attracted the attention of F. V. Reinhard, preacher

to the court at Dresden, through whom he became pastor at Schneeberg in 1807. He was appointed general superintendent at Gotha in 1816. B. showed decided rationalistic tendencies.

Brett, Reginald Baliol, and **William Baliol**, see **ESHER, VISCOUNTS**.

Bretten, Ger. tn in the *Land of Baden-Württemberg* (q.v.), 27 m. NW. of Stuttgart (q.v.). It has anc't walls and houses, and was the bp. of Melancthon (q.v.). Pop. 9000.

Bretton Woods Agreements, formulation of international monetary policy as agreed by the representatives of 44 nations at the international conference at B. W., New Hampshire, U.S.A., 1944, and subsequently ratified by most of the nations concerned. The object of the conference was to consider means of international monetary co-operation in order to aid international trade and to ensure stability of rates of exchange. The conference was agreed that international co-operation was essential to the maintenance of an international monetary system in order to promote trade, and that no nation should change its monetary policy without international consultation; and, further, that the nations should co-operate to increase foreign investment to enable the work of reconstruction to be carried out after the war. These aims were embodied in the B. W. Final Act by which the conference recommended that a permanent International Monetary Fund (q.v.) should be set up with a capital of 8800 million dols., and also an International Bank for Reconstruction and Development (q.v.) with a capital of 9100 million dols.

Bretts and Scots, Laws of the (Lat. *Leges inter Brettos et Scotos*), name applied to the laws relating to the Celtic tribes of Scotland in the 13th cent. The Scots were Celtic tribes in the highland dists., and the Bretts were the remnant of the Britons occupying the dist. of Strathclyde, or Cumbria. The dist. of Cumbria was held by the heir to the Scots throne, who was known as the Prince of Cumbria. The B. and S. were conservative in their Celtic traditions and institutions, but in 1305 Edward I of England ordained 'that the usages of the Scots and Bretts be abolished, and no more be used.' The fragments of the laws which remain are similar to the Brehon laws of the Irish. The system was an elaborate 'valuation' scheme, fixing the prices or 'cows' at which every man and woman was valued, from the king to the villen or churl. The basis of valuation was a cow—the king was valued at 1000 cows and a churl at 16. Hence was arranged a system of compensation for various injuries and crimes.

Bretwalda (probable trans. 'ruler of Britain'), title given by the 9th-cent. writer of the A.-S. Chronicle to Egbert, and, retrospectively, to 7 earlier kings. It was sometimes assumed by later ones, e.g. the term occurs in one of Athelstan's charters. Much historical argument has centred on the exact definition of B.; but it seems likely that it originated in the

early days of the A.-S. settlements among the followers of some king who considered him worthy of the title of overlord of Britain by virtue of his military successes over the Britons, gained in loose confederation with other invading groups. His authority over the other members of the confederacy was probably more apparent than real, and in any case temporary in character. See F. M. Stenton, *Anglo-Saxon England*, 1943.

Breuil, l'Abbé Henri (1877–), distinguished Fr. archaeologist, an authority on the Palaeolithic and particularly on cave-art of that period of which he has made many skilled copies. He has made detailed studies of his subject in the caves of France, Spain, China, Ethiopia, and S. Africa, and is regarded as the world's outstanding figure in this dept. of archaeology. He has been a prof. at the Institute of Human Palaeontology in Paris, and at the Collège de France; in 1937 he was awarded the gold medal of the Society of Antiquaries of London, the highest honour that learned society has in its power to bestow. His publs. include *Beyond the Bounds of History*, trans. by M. E. Boyle, 1949, and *Quatre cents siècles d'art pariétal*, 1952, trans. by M. E. Boyle in the same year.

Breul, Karl Hermann (1860–1932), Ger. philologist and educationist, b. Hanover, and educ. at Goethe Gymnasium, where he first studied theology. He then took up modern languages at Tübingen, where he studied under Ten Brink and Boehmer. Settled in England in 1884, and was appointed first univ. lecturer in German by Cambridge Univ., which had just estab. the medieval and modern languages tripos. In 1910 he was elected to the recently founded Schröder professorship of German at Cambridge Univ. Had a strong influence on education in his adopted country. President of Modern Language Association, 1910, and of the Eng. Goethe Society (founded 1886), and one of the founders and first editor of the *Modern Language Quarterly*, 1897. Made numerous contributions to the literature on the teaching of modern languages: *The Teaching of Modern Languages in our Secondary Schools*, 1898, repub. as *The Teaching of Modern Foreign Languages and Training of Teachers*; *Handy Bibliographical Guide to the Study of the German Language and Literature*; also produced well-annotated eds. of Ger. classics and an ed. of *Weyl's German Dictionary*. Ed. Eng. and Fr. texts, including a fine ed. of the *Cambridge Songs*—a notable contribution to the study of medieval literature.

Brunnerite, mineral consisting of magnesium carbonate, $MgCO_3$, together with oxide of iron. It is a variety of magnesite (q.v.) and is rarely found in the crystalline form.

Breve, note in music. It has now the greatest time-value, being equal to 2 semibreves. It is written thus \square or $\parallel O \parallel$, but is rarely found outside church music.

Breve, term in anc't Scots law denoting a writ issued by Chancery ordering a

judge to try by jury questions stated in the B. Until the institution of the Court of Session (1532) almost all civil actions in Scotland were commenced by B.

Brévent, mt of the Pennine Alps, in the dept of Haute-Savoie, France, rising above the valley of Chamonix. Its summit (altitude 8282 ft) commands a fine prospect of Mont Blanc.

Brevet, word used to denote commission given to officers of the Brit. Army, of or above the rank of captain, to a higher rank without regard to the number of vacancies there may be in the higher order. A general B. formerly occurred at intervals of 5 years, but it gradually became confined to occasions of public thanksgiving, e.g. coronations and satisfactory conclusions of military service. The system was found to be vicious, because the rate of promotion was not adjusted according to demand. In 1854 general B.s were abolished, and a system of individual B.s was organised for distinguished military service. B.s are not given in the navy. In the U.S.A. the system applies to first lieutenants and officers above that rank, but the commission does not entitle the holder to a higher rate of pay.

Breviarium Alaricianum, collection of Rom. law, compiled by the command of Alaric II, King of the Visigoths, in the year AD 506. In it are contained 16 books of the Theodosian code, the *Novels* of Theodosius II, Valentinian III, Marcian, Majorianus, and Severus; the *Institutes* of Gaius, 6 books of the *Sententiae Receptae* by Julius Paulus; 13 titles of Gregorian code, 2 titles of Hermogenian code, and a part of the first book of the *Responsa Papiniani*. By many people it is thought that Anianus was the composer of this code, and hence it is often called the 'Breviary of Anianus,' but by the Visigoths it was known as *Lex Romana*. It was only in the 16th cent. that it received the name of B. A., to distinguish it from a later ed. that was introduced in the 9th cent. for the benefit of the Romans in N. Italy. This B. A. is the only collection of Rom. law containing the first 5 books of the Theodosian code and the 5 books of the *Sententiae Receptae* which has been preserved, and at one time was the only work known, until the discovery of some MSS. in a library in Verona.

Breviary (Lat. *breviarium*), book which contains the offices for the canonical hrs in the Rom. Catholic Church. Though B. means a summary it was probably used because it was a compilation of the various books (psalms, prayers, etc.) needed in any one service. There are 8 canonical hrs: Matins, Lauds, Prime, Terce, Sext, None, Vespers, Compline. The Rom. B. has undergone sev. revisions. In 1536 a Spaniard, Francis, cardinal of Quiñones, made sweeping reforms in the B., by which he ensured that all the Psalms were read each week, and the major portion of the Bible each year. Although Rome refused to accept his revision, it is of exceptional interest to Englishmen, as the prefaces of the Eng.

prayer book are largely modelled on those of the cardinal, and the daily services of the Eng. Church are little more than condensations of the offices he enjoined. Till the Council of Trent every bishop had power to regulate the B. of his own diocese. Pope Pius V, however, while sanctioning those which could prove at least 200 years of existence, made the Rom. obligatory in all other places. Except for the Mozarabic B. in use at Toledo, and the Ambrosian that is followed in Milan, the Rom. has effectually superseded all others among the secular clergy, but monastic B.s still exist (e.g. for Benedictines and Dominicans). Since Pius V the Rom. B. has been revised sev. times for the purpose of simplifying the rubrics, improving the scriptural text, correcting the prosody of the hymns, and bringing the biographies of the saints into consonance with the results of historical research.

Brewer, David Josiah (1837-1910), Amer. jurist, b. Smyrna, son of a missionary of that place. Became a judge of the supreme court of the U.S.A. in 1889. He was president of the Venezuela Boundary Commission in 1896, and was a member of the Brit.-Venezuelan court of Arbitration at Paris in 1899. One of his most important decisions was at the time of the Chicago strike of 1894, when he estab. the right of the federal court to restrain obstructions to trains engaged in inter-state commerce or the transmission of mails.

Brewer, Ebenezer Cobham (1810-97), compiler, b. London. He studied law at Cambridge, and in 1836 took orders, but turned to literature, and in 1870 pub. his famous reference book, the *Dictionary of Phrase and Fable*, which has served 3 generations. Others of his 30 compilations are *The Reader's Handbook of Allusions, References, Plots, and Stories*, 1880, and a *Dictionary of Miracles*, 1884.

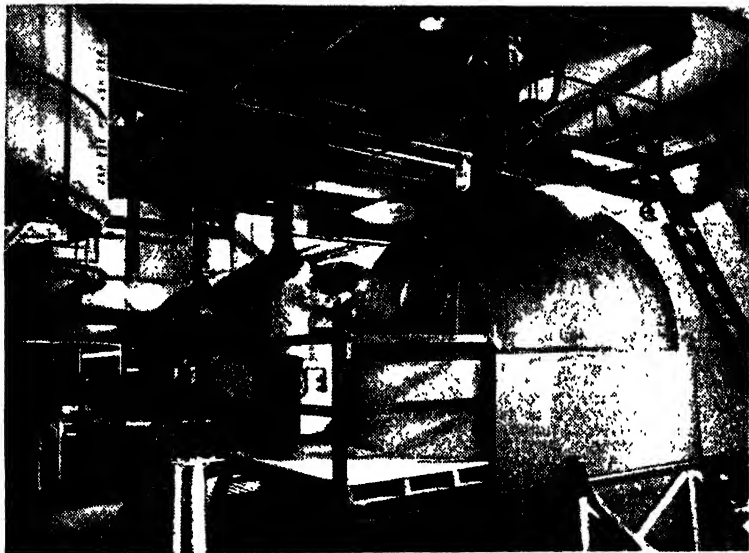
Brewer, John Sherren (1809-79), historian, b. Norwich. He was the son of a Baptist schoolmaster, and was educ. at Queen's College, Oxford. He was appointed lecturer in classics at King's College, London, 1839, and in 1855 prof. of Eng. language and literature, and lecturer in modern hist. He did much valuable research work. He pub. and ed. the *Monumenta Franciscana*, 1858, Bacon's *Opus Tertium* and *Opus Minus*, 1859, and a portion of the works of Giraldus Cambrensis, 1861. In 1877 he resigned from his academic posts to acquire the crown living of Toppesfield, Essex. There he continued his scholarly commentary on the records of the reign of Henry VIII.

Brewing, broadly the preparation of an alcoholic beverage from materials containing starch or sugar by fermentation, but usually the making of beer in all its varieties from malted barley (with which this article is concerned). In some countries other starchy materials, such as rice, maize, millet, and wheat, are used in place of or as adjuncts to barley, but the basic material is generally barley. The art of B. is of great antiquity. Inscriptions

of Egyptian life show clearly that beer was a popular national beverage on the banks of the Nile 3000 years before the Christian era. A short summary of the main processes involved in B. is given before describing the operations performed in greater detail. (1) The grain of the barley is first converted by a process of germination into malt, which is then steeped in hot water, whereby, by means of a chemical reaction to be described later, the starch contained in the malt is converted into soluble carbohydrates.

stances—barley, water, and hops—which form the basis of the manufacture will now be given.

BARLEY. The barley grain consists of a husk within which is the embryo of the plant and the endosperm, the latter consisting largely of reserve food material for the young plant. This reserve food, consisting of starch, protein, and mineral matter, forms the bulk of the grain and is the foundation material of the B. process. The varieties of barley grown commercially to-day are 2-rowed and 6-rowed



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BREWERY COPPER ROOM
Hops are being added to the wort.

(2) The liquid, now called the wort, is drawn off and boiled with hops (see *Hops*), which impart a bitter flavour, together with preservative properties. (3) The wort is transferred to large vessels and yeast is added, which causes the process of fermentation to set in, in which the sugar contained in the liquor is converted into alcohol. (4) Finally the liquor is drained from suspended matter and stored for periods varying with the variety of beer. About three-fourths of the world's beer is made by the continental system of B. beers of the lager type. The chief difference between this and the Brit. process will appear in the course of this article. In no industry are the condition and chemical composition of the raw materials of greater importance than in the manufacture of beer, and a description of the 3 sub-

varieties and of these the most favoured for B. were until recently the 2-rowed Plumage-Archer and Spratt-Archer; these are greatly improved varieties produced by hybridisation in the U.K. at the beginning of the cent. They have latterly been largely replaced by Scandinavian hybrids which give better yields for the farmer and are more suitable for modern methods of harvesting, though they do not so readily make good malt. The valuation of barley is largely carried out by visual inspection of the grain; this in the hands of the expert is very reliable, though increasing use is being made of chemical analysis. The grains should be fully developed and ripe, even in size and colour, and carefully threshed. The appearance of a section cut across the grain gives a good idea of the maturity of the corn and of its

ready 'maltability.' Miniature germination tests are carried out to ascertain its regular viability, so essential to malting.

WATER. Considerable importance is attached to the constitution of water used for B. and locality plays some part in determining the character of beer. The best British ales are brewed with waters approximating in composition to those occurring naturally in the Burton-on-Trent dist.; these contain a high proportion of gypsum or calcium sulphate. Mild ales or stouts on the other hand are brewed with soft water, e.g. in Ireland, or with water containing carbonates and chlorides. The finest continental lagers are brewed with very soft waters.

HOPS. The hops used by the brewer are the dried green cones which carry the seeds of the female plant of *Humulus Lupulus*. Hops are used primarily for flavouring but they have important preservative qualities. There are 3 important groups of substances carried by the ripe hop: (1) essential oils giving volatile aromatic flavours, (2) resins, giving bitterness and having preservative properties, (3) tannin-like bodies which play an important part in clarification and brilliancy of the final beer. The chem. of the hop substances is very complex and still in parts obscure; it is being increasingly unravelled by studies at the Brewing Industry Research Foundation at Nutfield and in other B. research laboratories throughout the world. Hops are still largely valued by eye and nose, though analysis of the resins is becoming of increasing use. The characteristic flavour of Brit. beers as compared with those brewed by the continental method is largely due to the higher proportion of hops used; this in a high-class pale ale may be double the amount used in a good lager.

MANUFACTURE OF MALT FROM BARLEY. The barley is first screened, which frees it from dust and extraneous matter. The grain is then ready for the malting process, whereby it undergoes important changes in constitution, chief of which is the secretion of a group of enzymes called amylases. The enzymes are a class of natural substances which possess the property of being able to decompose certain organic compounds such as starch and protein into simpler substances. There are 2 major methods followed in the malting of barley: the 'floor' method and the 'pneumatic drum' method. In the floor method the barley is first steeped in water for a period of 2 or 3 days. During steeping the grain absorbs the necessary moisture for germination, swells in size, and becomes full and soft. The operation is carried on in oasterns having draining racks at the bottom to facilitate the changing of the water. After steeping the grain is placed in heaps on the malting floor. This is situated in a dark, well-ventilated building in a dry position, having thick walls so that the temp. can be maintained constant. It is essential that the germinating process should be kept well under control, and should proceed uniformly throughout the material. Temp. rises as the grain

germinates; the heaps are turned and spread and occasionally sprinkled with water to keep the germination even. Air conditioning is installed in most modern maltings to enable temp. and ventilation to be controlled. The process of 'drum' malting, which is of modern invention, is similar in principle to that just described, but instead of being spread on a floor and turned by hand, the grain is placed in revolving cylinders in which ventilation and temp. can also be controlled. In both systems, under the influence of warmth and moisture germination commences within the corn. Carbon dioxide (carbonic acid gas) is given out by the young seed, and the embryo at the base of the corn begins to grow.



BREWERY MALT HOUSE

Barley, in process of germination, being turned on the floor.

When the acrospire or growing point, still under the husk, has reached about three-quarters of the way along the corn, growth is stopped by drying the malt on a kiln. Moisture is first driven off by the application of a moderate heat, and then the temp. is raised to the neighbourhood of 180° F., in order that the 'withering' process may be effected. By varying the conditions on the kiln, malts varying in colour and flavour to meet special requirements can be produced. The primary object of malting is to produce a high development of enzymes with a minimum loss of B. material.

BREWING. The malt is now ready to be used in the B. process proper. This is carried out in three stages: (1) Mashing, (2) Boiling, (3) Fermentation. As these consist of successive treatments of the soluble extract from the raw material it is customary to make the brewery a high building in which the extract flows by gravity throughout the first 2 stages and is then pumped to the top of the building for cooling prior to the third stage, after which it ends up in the cellar

as beer. The malt is first elevated to the top of the building where there are mills in which the malt is crushed before passing to the grist cases commanding the mash tuns.

Mashing. In the 'infusion' system of mashing practised in the U.K. the grist is mixed with hot water in a mashing machine and passed into the mash tuns—cylindrical vessels with false bottoms—at a temp. of about 145° F.; this is later raised by admitting hot water to the bottom of the mash tun. The mash is allowed to stand for 2 hours or more during which time the enzymes produced in malting convert the starch into soluble sugars and dextrins. These then, together with the soluble nitrogenous substances and some mineral matter from the malt, constitute the liquid extract called 'wort.' This is now run off through the false bottom at the same time as the grains are 'sparged' or sprinkled with hot water from a revolving arm. In continental B. a 'decoction' method is used in which the temp. in the mash tun covers a wide range; mashing is started at a low temp. and is raised in stages by removing portions of the wort to a separate vessel where it is heated to boiling and then returned to the mash tun.

Boiling. The wort is now run into coppers and boiled for 1½–2 hrs with hops. The object of boiling is to sterilise and to concentrate the wort and to extract the flavouring and preservative matters from the hops. Since some of these are volatile it is customary to add a proportion of the hops towards the end of the boil. Boiling also serves to coagulate some of the nitrogenous material in the wort and this assists in clarification of the beer. The hopped wort is then turned out into a hop back where the hops settle and form a filter bed on the false bottom. The filtered wort is then pumped to the top of the building where it passes through coolers prior to fermentation.

Fermentation. There are 2 types of B. yeast (*Saccharomyces cerevisiae*): (1) top fermentation yeasts which operate at normal temp. (60–70° F.) and produce a large crop of yeast at the top of the wort; these are used throughout the U.K. and in a few places elsewhere; and (2) bottom fermentation yeasts which function at temps. near the freezing point, are much slower in operation, and largely go to the bottom of the wort; these are used almost exclusively on the Continent and generally in the rest of the world.

(1) **Top fermentation.** Yeast from a previous fermentation or from a pure culture plant is added to the wort or 'pitched' at a temp. of about 60° F. After an initial 'lag' period, multiplication of the yeast proceeds very rapidly, a yeast crop of 3–5 times the weight of the original pitching being obtained. As a result the temp. of the fermentation rises and is controlled to a maximum of about 70° F. by circulating chilled water through coils of pipes (attenuators). Fermentation takes 3–4 days and may be completed in one vessel from which the

surplus yeast is skimmed off, or the wort may be 'dropped' into 'cleansing vessels,' from which the yeast is similarly skimmed, or into large casks from which the yeast is allowed to work over into troughs for collection (Burton Union System). At the end of fermentation the beer is further cooled before 'racking' into casks or storage for 'conditioning.' Details of treatment both during fermentation and storage vary with the type of beer and with the brewery. Mild ales are usually sold a few days after racking, while the pale ales and bottled beers are stored for a week or more, sometimes sev. weeks; strong beers are sometimes stored many months. Draught beers are usually clarified before sale by the addition of finings, a preparation of isinglass; mild ales are sometimes sweetened by the addition of 'priming.' The light bottled ales are usually 'carbonated' by the addition of carbon dioxide gas after chilling and are then filtered.

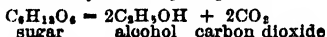
(2) **Bottom fermentation.** The pitching takes place at about 40° F., and the major part of the fermentation in open vessels takes 10–14 days to complete; the beer is then chilled to between 34° and 36° F., and dropped into closed tanks in cold cellars for 'lagering,' a process which takes up to 6 months. After this the beer, highly charged with carbonic acid gas, is filtered under pressure into casks or bottles. It is stored and served cold.

CHEMISTRY OF BREWING. All industry is concerned with bringing about changes in the shape, arrangement, or nature of natural materials, usually by the application of external forces. In B. the chemical changes which take place are brought about by the action of natural forces inherent in the materials, and the brewer's art is so to control these forces as to obtain the desired results. The agents activating these forces are known as enzymes and are complex protein substances produced by living cells; they have the power of initiating profound and far-reaching changes in biological materials. They bring about the change of insoluble food materials into simpler substances which the organism can make use of for its growth and as a source of energy (as in normal digestion), and they can also act in the reverse direction and build up from such simple substances the complex material which makes up living tissue. Though they are produced and normally operate within the living cell they are not themselves living, but they can be isolated from the cells, sometimes in crystalline form, kept indefinitely without change or decomposition, and used to perform outside the living cell the functions they normally perform within it.

It was the isolation of the enzyme *zymase* by Buchner (1897) which finally resolved the long-standing controversy between Pasteur, the Fr. chemist, and Liebig, the famous Ger. scientist. Pasteur (1860) had shown beyond a shadow of doubt that yeast was always associated with alcoholic fermentation, which, he maintained, resulted from the

normal functioning of the living yeast cell ('life without air,' he called it); Liebig claimed that the fermentation was caused by forces liberated from decomposing albuminoid matter and that the presence of yeast cells was only incidental. Buchner succeeded in isolating from yeast an albuminoid substance which he called zymase; this he was able to show brought about the fermentation in the absence of any living yeast, thus showing that both protagonists were to an extent right and that their theories were not entirely mutually exclusive. Normally the action takes place inside the yeast cell and not outside as Liebig thought; nor is the enzyme decomposed in the process, for it was found that a very small quantity of enzyme could bring about the breakdown of very large quantities of sugar without suffering any loss of power; enzymes acting in fact as biological catalysts.

Much study has been devoted to the chemical changes occurring in fermentation, the overall results of which can be indicated by the simple equation:



It is believed to-day that to reach the end point shown in the equation the action passes through at least 12 different stages in which 12 different enzyme systems are involved. This indicates the great complexity of such natural changes, and it is typical of the many which occur in the course of B. from the first growth of the embryo barley on the malting floor to the final production of matured beer in bottle.

The major enzymic change takes place in the mash tun when starch, the plant's chief reserve food material, is broken down to simpler carbohydrates. Starch, a complex body of empirical formula $\text{C}_6\text{H}_{10}\text{O}_5$, has a molecular weight of over 50,000; and most of this under the action of the amylase group of enzymes is converted into a fermentable disaccharide maltose (molecular weight 300), but at the same time both simpler and more complex sugars are produced, including monosaccharides, trisaccharides, and a range of oligosaccharides formerly called dextrans. Enzyme actions are very sensitive to temp., and by varying the conditions in the mash tun the brewer is able to vary the constitution of the wort and so the nature of the resulting beer. Similarly protein breakdown, which occurs chiefly in the course of malting, results in the production of a wide range of nitrogenous bodies, including polypeptides, which are important for flavour and foam formation in the beer, and amino acids, which are essential for the growth and activity of the yeast.

VARIETIES OF BEER. The 2 main varieties of beer consumed in the U.K. are ales and stout. Ales are of 2 kinds, mild and bitter, and their difference in taste is due partly to the fact that a larger amount of hops has been used in the case of the bitter ale than in the case of mild. They are manufactured from pale malt, which has not been heated to a high temp. on

the kiln. The process of slow fermentation which goes on in the casks or tank while the ale is being stored and the consequent formation of carbon dioxide is the source of the refreshing and 'sparkling' qualities which characterise this beverage. In order that this slow fermentation may take place, the presence of a certain amount of fermentable sugar in the casks when they are stored is necessary. This is ensured by the temp. in the mash tun and by the type of yeast used in the fermentation.

Stout is brewed from a special mixture of malts, including roasted malts or roasted barley.

Lager. The chief differences between Brit. and continental beers have been shown to be in the method of mashing, the lower hop content, and the slow fermentation at low temp. Most lager beers are pale in colour, but dark beers of the 'Munich' type correspond to our mild ales. The light colour and mild flavour of the pale lagers must not be taken to indicate weakness: most lagers contain more alcohol than our draught beers or our bottled light ales. Stouts are seldom brewed outside the U.K., when they are usually brewed by Brit. methods. In recent years there has been a notable increase in the consumption of bottled beer as compared with draught beer. This has been brought about largely by the introduction of the system of chilling, carbonating, and filtering bottled beer, introduced at the beginning of the cent.: this improved the keeping qualities of the beer and to-day is sometimes accompanied by pasteurisation. It has also been fostered by modern methods of road transport.

BEER DUTY. For every 36 gallons where the worts were, before fermentation of a sp. gr. of 1030° or less, the duty is, (Aug. 1856) £7 15s. 4½d., for every additional degree in excess of 1030°, 6s. 7½d.

Consumption of beer in the United Kingdom. The production and consumption of beer in the U.K. showed a gradual decline from the end of the 19th cent. until 1933, when it began to recover. It continued to do so until 1946, when it again declined during 5 years to a level at which it has, broadly speaking, since remained. In 1899, 37,404,000 barrels of beer were brewed; in 1933, 17,950,303; 1946, 32,650,200; 1951, 24,891,746; 1955, 24,353,996.

REVENUE FROM BEER. The U.K. derives a substantial proportion of its revenue from the duty on beer. In 1925 the Chancellor of the exchequer was enriched from this source to the extent of £75,825,828; for 1956-7 the revenue is estimated at £258,506,000. The world's largest breweries are those of Guinness & Son in Dublin and Bass & Co. in Burton-on-Trent, though the Schultheiss Patzenhofer brewery in Berlin was as large. It is of interest to note from the consumer's point of view that whereas the main brewing industry costs (raw materials, fuel, transport, and building and repair of licensed houses) has risen threefold and more since before the last war, the

basic price of beer—that is, of draught beer in the public bar—apart from tax, has not so much as doubled. The duty, on the other hand, has risen on the pint of average strength from 2d. in 1939 to roughly 8½d.

See H. Lancaster, *Practical Floor Maltng*, 1908; A. C. Chapman, *Brewing*, 1912; C. A. Warren, *Brewing Waters*, 1923; E. S. Beaven, *Barley*, 1947; W. H. Nithsdale and A. J. Manton, *Practical Brewing*, 1947; R. H. Hopkins and C. B. Krause, *Biochemistry of Brewing and Maltng*, 1947; H. L. Hind, *Brewing Science and Practice*, 1948; J. De Clerck, *Cours de Brasserie*, 1948; B. M. Brown, *The Brewer's Art*, 1948; C. A. Kloss, *The Art and Science of Brewing*, 1949; H. Hunter, *The Barley Crop*, 1952; I. A. Preece, *The Biochemistry of Brewing*, 1954; E. J. Jeffery, *Brewing Theory and Practice*, 1956.

Brewood, tn in Staffs, England, 11 m. from Stafford, chiefly concerned with agriculture. Pop. 3500.

Brewster, Sir David (1781–1868), philosopher, b. Edinburgh. His father was rector of the grammar school in that tn. Sent to Edinburgh Univ. at the age of 12 to study for the Church of Scotland, finished his course in divinity, but never entered into active ministry in the Church. Successively a pharmaceutical chemist, lawyer, and physicist. Specialised in optics. He was elected F.R.S. in 1815. In 1816 he invented the optic toy known as the kaleidoscope. Improved Wheatstone's stereoscope by substituting lenses for the mirrors used to combine the pictures. Invented the dioptric apparatus, used in lighthouses, consisting of a central lamp, the rays from which are transmitted by an arrangement of lenses surrounding it. Made significant contributions to the development of other optical instruments, and discovered the relation between refractive index and polarising angle, R.'s Law. Editor of sev. scientific periodicals. He wrote *Letters on Natural Magic*, 1832, *More Worlds Than One*, and a book named *Martyrs of Science*, 1841. But his literary fame will rest chiefly on his *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, 1855. To suggestions of his in an article in the *Quarterly Review*, the Brit. Association for the Advancement of Science owes its origin. B., Babbage, and Herschel were the active shapers of its constitution. In 1832 B. was knighted, and in 1838 he was appointed principal of the colleges of St Salvador and St Leonard, St Andrews. He had many European honours, and was one of the 8 foreign associates of the Fr. Institute. In 1859 he was made principal of Edinburgh Univ., where he remained till shortly before his death, which took place at Allierly, Melrose. See L. Playfair, *Sir David Brewster*, 1868, and Mrs Gordon, *Home Life of Brewster*, 1869.

Brewster, William (c. 1566–1644), Amer. colonist, one of the prin. men of the Pilgrim Fathers, b. Scrooby, Notts. After holding sev. secretarial appointments, he became post (the postmaster

responsible for relays of horses) in his native tn of Scrooby. In 1606 he helped to form a Separatist Church. He suffered persecution, but at last obtained a land patent from the Virginia Co. In 1620 he sailed in the *Mayflower*, and helped to found Plymouth colony.

Brewster Sessions, ann. meetings of magistrates or justices to hear applications for licences or renewals of licences by retailers of intoxicating liquors. They are held during the first fortnight of Feb. B. S. are regulated by Section 10 of the Licensing (Consolidation) Act, 1910.

Březina, Otakar, see JEHAVÝ.

Brialmont, Henry Alexis (1821–1903), Belgian general and author, the son of Gen. Laurent B. In 1843 he passed from the military school at Brussels into the army as sub-lieutenant of engineers. From 1843 to 1874 he rose to the rank of major-general. As major-general he became director of fortifications in the Antwerp dist., and within the year inspector-general of fortifications and of the corps of engineers (1875). It was probably the unpopularity of his elaborate schemes for reformed fortifications at home that induced him to accept an offer from the Rumanian Gov. to take over the direction of the works necessary for the country's defence. He actively identified himself with the scheme which raised Bucharest to a first-class fortress. In 1884 he was reinstated in his former command of the Antwerp dist., and was responsible for the fortifications at Namur and Liège. Among his publs. may be mentioned his last, entitled *Progrès de la défense des États et de la fortification permanente depuis Vauban*, 1893. In the First World War B.'s forts at Liège and Namur proved to be unable to withstand effectively the fire of the Skoda guns brought against them by the Germans.

Brian, surnamed **Borolmhe** (Boru) (c. 926–1014), belonged to a tribe of N. Munster. When his brother, the King of Munster, d. in 976, he ascended the throne and began his career of conquest. On subduing Leinster, he next overcame the Danes estab. near Dublin, and after killing Malachy, the King of Ireland, was himself recognised as Ard-Ri, or ruler of his country. Successful in many battles against the Danes, he was killed in one at Clontarf, 23 April 1014.

Brialmon, Charles Julien (1785–1864), Fr. mathematician, b. Sévros. He became prof. of applied science at the École d'Artillerie. Among his works are *Mémoire sur la poudre à tirer*, 1823, and *Essai chimique sur les réactions foudroyantes*, 1825. B.'s theorem, called after him, is as follows: If a hexagon be described about a conic, the 3 diagonals will meet in a point.

Briançon (ancnt **Brigantium**), Fr. tn, cap. of an arron., on the Durance (q.v.), in the dept of Hautes-Alpes. The older part of the tn, strongly fortified by Vauban (q.v.), is over 4000 ft above sea-level. It is a health and winter-sports resort, and has a trade in *crête de B.* (Fr. chalk), sweets, and cheese. Pop. 6700.

Briand, Aristide (1862-1932), Fr. statesman, b. Nantes, son of a small Breton farmer. B. was 11 times premier of France, and one of the 3 leading Frenchmen who immediately prior to, during, and after the First World War directed Fr. policy, the other two being Poincaré (q.v.) and Clemenceau (q.v.).

While still studying law, B. was drawn into socialist politics and journalism. His writings and speeches at this time were considered fairly extreme, and his anti-clericalism was very obvious. In 1902 B. became a deputy. He at once made his name, for the question of the relations of Church and State was the question of the day. He was appointed *rapporteur* of the committee of the chamber appointed to consider the law governing the religious congregations, and it was partly due to his influence that the law was passed with but slight modification. His first term of office came in 1906, when Sarrien offered him the post of minister of public instruction and worship, a position which he accepted so as to be able to carry through the secularisation law he had been instrumental in framing. In Oct. 1906 Clemenceau, who had formed his first gov., in succession to Sarrien, invited B. to remain in his post, which he did, but in 1908 he was transferred to the ministry of justice.

On the fall of Clemenceau's gov. in July 1909 he was called upon for the first time to form a gov. This he did, adding to the presidency of the council the portfolios of interior and of public worship. It was during the life of this gov. that the railway strike of 1910 occurred. Finally breaking with his old Socialist doctrines, he arrested the strike committee, mobilised the railway reservists, and dismissed those who refused this call to the colours. This action broke the strike, but it broke also his ministry (1911). In 1913, on Poincaré's election to the presidency of France, B. again became premier, and it was during this brief administration that he extended the period of military service. On 18 Mar. 1913 this gov. fell on a defeat by the senate of its proposals for electoral reform. Thereafter until the outbreak of the First World War he remained more or less out of the public eye.

In Aug. 1914, on the outbreak of the First World War, B. became minister of justice under Viviani. In 1915 he became premier again, being also foreign minister. He resigned in 1917, as a result of the Salonika expedition; his influence had, however, done much to bring Italy and Rumania on to the allied side. B. became premier and foreign minister again in 1921. The fulfilment of the treaty of Versailles was now the paramount question in Fr. politics. B. attended the Washington naval disarmament conference, 1921, and the Cannes conference, 1922. His tentative approaches with a view to a Franco-Ger. understanding made Poincaré one of his chief enemies, and in 1922 he was forced to resign. He was again in office as minister of foreign affairs in Painlevé's gov. in 1926, and continued to hold office

on the reconstruction of the ministry. It was while he held this position that the Locarno treaties (q.v.) were negotiated, pacts with which B's name is associated equally with that of Austen Chamberlain. By the prin. pact the chief Allies and Germany jointly undertook to guarantee peace in W. Europe. This pact was concluded in Oct. 1925, and greatly heightened B.'s prestige, so that when Painlevé resigned in Nov. B. once more headed the gov. But France's financial difficulties were at this time so serious that the life of her govts. was short. A period of instability ended when Poincaré, the ex-president, formed a ministry to deal with the financial question. This ministry came into office on 21 July, and B. returned to his old post of minister of foreign affairs. From then he held that post practically continuously, working for the reconstruction of Europe and its pacification. For this work he received, among other honours, the Nobel peace prize (1926). His name is closely associated with the Kellogg Pact (q.v.), his influence doing much to secure its general acceptance.

B. next proposed an ambitious scheme for the federal union of Europe. This, the memorandum on a 'Régime d'Union Fédérale Européenne,' dated 1 May 1930, was prepared by B. in response to the request of 27 European nations that he would specify further and more exactly certain tentative proposals that he had put before their delegates at Geneva. He envisaged a union of free independent states, not a merging of national sovereignty into a unified authority—a distinct retrocession from his former attitude. But his scheme came to nothing as the economic depression and the disarmament controversy soon overshadowed it. Soon after this B. retired to his estate in Normandy, where he d.

B. was the born orator and parliamentarian, to whose faculties the approach of a political crisis gave a keen edge. For most Frenchmen B. was a great figure in that he embodied for them the pacific solution of international difficulties and was veritably the symbol of the peace which he had tried to promote by the scheme of European federation. He had begun his political life as an extreme socialist and atheist; he d. a devout Catholic and the idol of the middle classes. See life by V. Thompson, 1930.

Briansk, see BRYANSK.
Brianza, hilly region of Italy, S. of Lake Como (q.v.). It is much frequented by tourists because of its beautiful scenery and fine climate. It is densely populated, and is a favourite resort for the Milanese. The chief tn is Cantù (q.v.).

Briar, or **Brier** (*Rosa rubiginosa*), flowering plant of the rose family; also known as the true sweet B., or egplantine (q.v.). Other species are *R. inodora*, a slightly scented B., and *R. micrantha*, the small-flowered sweet B. Various species of Brit. roses of larger growth are known as B. roses, specifically the dog-rose (*R. canina*). See also ROSE.

Briar-root, hard wood obtained from the root stock of *Erica arborea*, the common heath-plant of S. France, which is largely used in the manuf. of pipes. *Bruyère* is the French for heath, and the word has no connection with Eng. 'briar.'

Briare, Fr. tn in the dept. of Loiret, on the Loire, and the B. canal. It manufs. pottery, toys, and buttons. Pop. 3800.

Briareus, see *Aegaeon*.

Bribery, term in Eng. law, with four-fold signification: 1. The offence of a judge, magistrate, or any person concerned in the administration of justice receiving a reward from parties interested for the purpose of procuring a partial and favourable decision. Since the revolution in 1688 judicial B. has been unknown in England, and since that date no case is reported in which this offence has been imputed to a judge in courts of superior or inferior jurisdiction. 'Embracery' is the offence of attempting to influence a jury corruptly to give their verdict in favour of one side by the promise of money or entertainment or by entreaties. The offence is a misdemeanour punishable by fine and imprisonment. A juror may be guilty of this offence if he corruptly influence his fellow jurors. 2. The receipt or payment of money to a public ministerial officer as an inducement to him to act contrary to his duty. B. of a public ministerial officer is a common law misdemeanour in the person who takes and also in him who offers the bribe. B. with reference to particular classes of public officers has become punishable by sev. Acts of parliament. B. of customs officials, officials of the inland revenue, and, under the Merchant Shipping Act, of officials of the board of trade is punished with heavy penalties. B. of officials invested with powers of local gov. or administering the rates is punishable with imprisonment up to 2 years, together with a heavy fine and incapacity to hold any public office either for a number of years or for life. 3. The giving or receiving of money to procure votes at parl. elections, or elections to public offices of trust. The Corrupt Practices Act, 1854, deals with the offence of corruptly influencing a voter to give his vote in any particular way. The Representation of the People Act, 1867, enacts that a corrupt payment of rates to enable a person to be registered as a voter so as to influence his vote at any future election is B. All kinds of conduct have been held to be B. The conduct need not be dishonest provided there be no intention to influence the mind of the voter. Charitable gifts on an increased scale at Christmas may be B. when a certain vote or votes is or are aimed at. A promise of a bribe is B., and so is accepting a bribe even though one does not vote. Where the gift of money or entertainment takes place after an election, the giver is not guilty of B. unless something has happened before the election to raise the hopes of the voter. A mere offer of sale of a vote is not B. 4. Miscellaneous: corrupt presentation to a benefice is B., and buying and selling of public offices is also B. at common law.

B. may, under a recent Act, be constituted by the taking of a secret commission. The gist of this offence is the making of a profit by an agent without the knowledge of his principal.

Brice, St. (d. 444), Fr. prelate, b. Tours. On the death of St Martin, he was chosen Bishop of Tours, where he d. after a stormy career. His feast is on 13 Nov.

Brick, mass of clay, usually mixed with sand, fine coal ashes, small coal sifted, or other ingredients, tempered with water, shaped in a mould, and subsequently dried in the sun and, in most cases, burned or baked in a kiln or a heap or stack called a clump. The ancts used B.s both baked and simply dried in the sun. Those found in the ruins of Babylon are among the oldest specimens existing. The Egyptians used sun-dried B.s, and the process of making them is represented in their paintings. The Romans, according to Pliny, began to use B.s at about the decline of the rep.: but there are yet remains of a B. building called the temple of the god Iodolus, which is said to have been built on occasion of the retreat of Hannibal. It has been supposed that the Greeks did not use B.s until after their subjugation to Rome; but passages from Vitruvius and other writers show that B.s were in use before that period. The Gk names for B.s were *didoron*, *tetradoron*, and *pentadoron*, terms formed from *doron*, a hand-breadth, and describing their size as equal to so many hand-breadths. They appear to have been used simply dried, as Vitruvius speaks of their requiring 2 years to dry, and of the laws of Attica requiring that 5 years be allowed for that purpose, and because further he warns against using them too new for fear of their shrinking. Rom. B.s were very thin in proportion to their length and breadth, and were well burnt. They resemble tiles more than modern B.s, and are formed of various dimensions, from $7\frac{1}{2}$ in. square and $1\frac{1}{2}$ in. thick, or even smaller, to about 1 ft 10 in. square and 2 in. thick. In Persia B.s are used both sun-dried and baked. The latter resemble Eng. clump-burned B.s; but the former are, like the Egyptian B.s, mixed with straw cut fine, to give them greater tenacity. In making ordinary Eng. B.s the top soil, or *encallow*, is first removed from the clay, which is dug and turned over in the winter. Exposure to wet and frost prepares it for use by the spring, when fine ashes are added to it in the proportion of one-fifth ashes to four-fifths clay, or 60 chaldrons to 240 cub. yds, which will make 100,000 B.s. When much sand is mixed with the clay, forming what is called a mild earth, a smaller proportion of ashes may be used. This quantity requires also the addition of about 15 chaldrons, or, if mild, of about 12 chaldrons, of *breeze*, which is a kind of coarse coal ash, separated by sifting, to aid the burning. The clay and ashes being well mixed by digging, watering, and raking backwards and forwards with a pronged hoe, the mass is removed in barrows to the *pug-mill*, which consists of an upright barrel in which a series of

strong iron knives and teeth is caused to revolve by the power of a horse walking in a circular path, so as to cut and masticate the clay thoroughly as it passes from the top of the barrel to an aperture provided for its exit at the bottom. As the clay oozes out of the mill it is removed with a *cuckold*, or concave shovel, and covered with sacks to prevent its drying too fast. A person called the feeder takes from the stock of clay thus prepared a piece about the size of a B., covers it with sand, and passes it to the moulder, who throws it with some force into a wooden mould of the size and shape of the B., which mould is previously sanded. Having filled the mould, the moulder cuts off any superfluous clay with a stick kept in a bowl of water by his side, and then removes the back and sides of the mould, after which the soft B. is transferred from the bottom board of the mould to a pallet-board, and, when a sufficient number have been moulded, is conveyed with others to the *hacks*, which are long, level lines raised about 4 in. from the surface of the field, and formed about 2 ft. 6 in. wide. The upper surfaces of the B.s are previously sanded, and care is taken to avoid twisting or otherwise injuring their shape in transferring them to the hacks, on which they are laid in 2 rows, with a little space between each to allow the free circulation of air. One double row being completed, another is put upon them, and this is continued until the B.s are piled from 7 to 10 high. When partially dried the B.s are removed, placed diagonally, with wider apertures, and with the bottom B.s brought to the top; and after this process, which is called *skintling*, they are removed to the kiln or clamp, which is a vast pile of B.s, laid together as closely as possibly on a slightly concave foundation of B. rubbish, the raised ends of which face the N. and S. On this foundation the new B.s are built up in lots or *necks*, of which the centre one, which is first erected, is vertical, while the others, owing to the concavity of the foundation, have a slight inclination towards it. Small spaces, filled with breeze, are left among the lowest courses of B.s, and flues or *live-holes*, about the width of a B., and from 6 to 9 ft. apart, are also formed to aid the lighting of the clamp, and filled with dry bawns or wood. When full the clamp is surrounded by old B.s, or by the driest of those newly made, and a thick layer of breeze is spread on the top. The external B.s are coated with a thin plastering of clay; and, if the weather prove wet, the kiln is protected by *loos*, or hurdles interwoven with rushes. The fire is lighted at the mouths of the flues or live-holes, which are closed when it burns well; and in favourable weather the B.s will be completely burnt in about 25 or 30 days, in the course of which time the cindery matter dispersed through their substance becomes gradually ignited and consumed. Such B.s as are found to be imperfectly burnt are put into the next clamp to be burned again. Those which are sufficiently burnt are separated, according to quality, into hard sound

stocks; *places*, or inferior soft red B.s; and *burrs* or *clinkers*, which are black-looking masses of vitrified B., of very inferior value. Ordinary B.s are moulded in this country 10 in. long, 5 in. wide, and 3 in. thick, and are reduced by drying and burning to about 9 in. long, 4½ in. wide, and a proportionate thickness. Kiln-burnt B.s are, as their name implies, burnt in a kiln or an oven instead of a clamp, and have no ashes mixed with the clay. Marl or malm stocks, which are either baked or burnt, take their name from the marl originally used in them, which has now given place to chalk. Dutch clinkers are a kind of small, hard, yellow B. Fire-bricks, also called Windsor B.s, are 1½ in. thick, and of a quality to resist the action of fire. Paving B.s, draining B.s, capping or coping B.s, corging B.s, compass B.s, for wells and circular works, feather-edged or thin B.s for the external parts of wooden buildings, and many other varieties of form, size, and quality are made. In some cases a smooth or glazed surface is produced in the burning. There are 2 kinds of B. machine: one which works with clay in a semi-dry condition, and thus saves time in drying, and the other which works with moist clay. In the latter the clay is fed into an upright pug-mill which mixes it to the desired consistency and forces it out at the bottom over carrying rollers, so that it passes between 2 pressing rollers which force it through a die giving it the required size. The block is then cut into B.s by wires on a frame which is so arranged that the wires can cut rectangularly or at an angle. In the first machine the clay, already very solid, is forced by blades into shape on a revolving table which ejects the B.s under a press. They are then ready for drying. The largest brickworks in the world are at Stewartby, Beds, England. See also *BUCKWORK* and *POTTERY*. See A. B. Searle, *Modern Brickmaking*, 1920, and E. Dobson and A. B. Searle, *Bricks and Tiles*, 1936.

Brick-making, see **BRICK**.

Brickfielders, term used in Australia to describe a hot wind which blows from the barren, sandy deserts of the interior. Like the strong 'southerly buster,' by which it is followed, it is occasioned by a cyclonic system over the Australian Bight. It is a healthy wind in that its extreme heat and dryness destroy disease bacteria, but it parches vegetation and creates dust storms. Usually it blows sev. days together.

Bricklaying, see **BRICKWORK**.

Brickwork, fitting together of bricks so that they mutually support each other, the strength of each individual brick, as well as that of the mortar by which they are united, being applied in the most effectual manner to aid the strength of the whole structure. B. is *banded* by breaking or distributing the joints so that 2 never come immediately over each other, and by laying some of the bricks as *stretchers*, or stretching courses, with their length in the direction of that of the wall, and others, which are called *headers*, with their

length running across, or in the direction of the breadth or thickness of the wall. The bonds in most common use are *English bond*, consisting of alternate layers or courses of headers and stretchers; *Flemish bond*, in which headers and stretchers are laid alternately in the same course, the headers of one course being laid across the middle of the stretchers of the course below it; *garden-wall bond*, consisting of 3 stretchers and 1 header in the same course; and *herring-bone bond*, which is sometimes used in the case of very thick walls, and is produced by laying the bricks at an angle of 45° with the direction of the wall, and reversing the inclination of each successive course. Where necessary, to prevent the *perpends*, or vertical joints, coming immediately over each other, a half, quarter, or three-quarter brick, or *bat*, is used to commence or finish a course. Walls the thickness of which is 9 in. or equal to the length of 1 brick are called single-brick; those half that thickness, half-brick; and others brick and a half, 2 bricks, 2 bricks and a half, etc. Arched and groined work requires great skill and much cutting of the bricks to fit each to its particular bed. The *mortar* (q.v.), used for bedding and jointing, once composed of lime and sand, is now usually made from cement (q.v.), lime, and sand, proportioned to give the strength required. *Putty* is a very fine kind of mortar, made of lime and water only, used for delicate purposes, and such as the setting of rubbed or gauged arches, where the joints are visible. The foundations of a wall are always laid broader than the superstructure, and the broader courses are termed *footings*, the projections themselves being called *set-offs*. Garden walls are usually strengthened with piers or buttresses projecting 4 in. at intervals of 10 or 12 ft. B. is measured by the *rod* of 272 superficial feet. See N. Lloyd, *A History of English Brickwork*, 1928; W. Frost, *The Bonding of Brickwork*, 1933; F. Walker, *Brickwork*, 1937.

Bride, St, see BRIGIT, St.

Bride (Teutonic word; O.E. *bryd*), term used of a woman about to be married, also during the first year of her married life. With it are associated many other words, such as 'bridegroom,' 'bride-bell,' now known as 'wedding-bell,' etc. In former times the friends assembled in the church porch to throw grains of wheat over the bride; but paper confetti is now generally used. Small cakes prepared for the wedding breakfast replaced the wheat, which developed into the large cake which is the custom of the present day.

Bridel, Philippe Cyriaque (1757-1845). Swiss writer, better known as the 'doyen Bridel,' was successively pastor at Basel, Château d'Ex, and Montreux. As his *Poésies helvétiques* were pub. in 1782, he may justly be considered the first Vaudois poet, as well as the initiator of '*helvétisme*.' He is celebrated for his delightful, if not always accurate, descriptions of his travels. His style is simple and unaffected, and all his work glows with the warmth of patriotic sentiment. His *Course de Bâle à Bienne par les Vallées du*

Jura appeared in 1789, while much of his descriptive writing is in *Étrennes helvétiques* and *Conservateur suisse*, 1783-1831.

Bridewealth, or **Brideprice**, property transferred at marriage in many societies from the husband's to the wife's family. By it are acquired rights over the children, who belong to the husband's clan. It is neither dowry nor wife purchase, although often so called. See A. Phillips, *Survey of African Marriage and Family Life*, 1953.

Bridewell, hospital in Blackfriars, London. The name is derived from a well within the palace of King John, dedicated to St Brigid or Bride, and from which the par. is called. In 1552 Edward VI granted the manor house and palace of Bridewell to the city of London as a house of correction for vagrants. It became one of the 5 royal hospitals (1557) but separated and was united to Bethlem for administration purposes. Rebuilt at end of 18th cent., it was demolished in 1864.

Bridge, Sir Cyprian Arthur George (1839-1924), Brit. admiral, b. St John's, Newfoundland. He entered the navy in 1853, and became rear-admiral in 1892. On his retirement, in 1904, he was Commander-in-Chief of the China station. He served on various committees, on explosives, ordnance, etc.; also on the commission on the N. Sea incident of 1904, and on the commission to inquire into the campaign in Mesopotamia, 1916.

Bridge, Frank (1879-1941), composer, b. Brighton, studied at the Royal College of Music, became an excellent quartet player (viola) and a gifted conductor, but led on the whole a retired life and taught only privately. As a composer too he cultivated chamber music for preference, though he also wrote a large amount for the orchestra, the piano, and the voice.

Bridge, construction which provides a continuous path or road over water, valleys, ravines, or above other roads. The term is applied also to cases in which some part of the B. is temporarily removable, or in which a suspended platform conveys passengers or goods across a space; those carrying water are

AN EGYPTIAN TRUSSED FRAME

termed aqueducts (q.v.). Timber, being readily worked by primitive tools, was, no doubt, the material first used for the construction of B.s by art—simple beams on natural piers or supports. Herodotus speaks of a B. of this type

across the Euphrates at Babylon, consisting of beams resting on stone piers ascribed to the time of Semiramis, 2230 B.C. B.s formed of boats, or pontoons, connected by timbers, were used in early times. Xerxes crossed the Hellespont by this means in 450 B.C. Suspension B.s, in which a long, narrow floor is hung from, or carried upon, ropes or chains, are said to have been used in China at a

Trinità B. of 3 spans at Florence, by Ammanati, 1566, and the Rialto B. by Antonio da Ponte, Venice. In Great Britain the numerous old stone B.s over rivs. and moats are structures of great beauty (e.g. Stopham B., Sussex, Elvet B., in the city of Durham), though not very remarkable engineering feats.

There was, indeed, little advance in B.-building between 1200 and 1739 and



RIALTO BRIDGE, VENICE

remote date, and were certainly in use by the Incas of Peru up to 200 ft span in the 16th cent. Upon Trajan's column (A.D. 100) the B. built by him across the Danube is represented. Great doubt exists as to the width of openings, which were spanned by timber arches, but the piers are said to have been 150 ft high. The Romans were indeed from this time forward great B. builders; many of their works (if we include aqueducts) are still in use, or at least standing. The semi-circular arch was with them the rule.

With the decline of Rome construction

1760, in which two latter years old Westminster and Blackfriars B.s across the Thames, by Labelyo and Mylne respectively, were commenced. The first of these is of note because of the method of founding the piers by caissons (q.v.); the second is of interest because it appears to be the first instance in this country of the use of the elliptical arch, which gave rise to a widespread discussion between mathematicians and others, in which Dr Johnson took part, as to the practicability of constructing such an arch, notwithstanding that Ammanati's B. had been



BRITANNIA, MENAI STRAITS



SALTASH

of B.s lapsed, till the great revival in Italy 1000 years later. The originality and boldness of the early builders are well illustrated by the arched B. of 184-ft span, rising 60 ft, built in 1454 over the R. Allier in France, and by the great arched B. of 251-ft span over the R. Adda, of the latter part of the 14th cent., later destroyed by Carmagnola. Regard for beauty is shown by such examples as the

standing nearly 200 years. Both Blackfriars and Westminster B.s failed eventually by sinking of the piers. The best-known examples of more recent times which were considered completely successful were the London and Waterloo B.s by Rennie, both fine structures having elliptical arches of granite, that at the centre of London B. being of 152-ft span. When the centre piers of Waterloo B.

settled conspicuously, the L.C.C. decided on reconstructing it (see WATERLOO BRIDGE).

In modern B.-building 4 types are used: the girder, arch, cantilever, and suspension B.s. Though generally girders



A



B



C



D



E

TRUSSES

A. Howe; B. Bollman; C. Fink; D. Whipple; E. Pratt.

are only suitable for short spans and the suspension B. is the only solution for very long spans (greater than 1800 ft), the choice of type in any given case depends on local conditions such as total width to be bridged and possibility of dividing the width into spans, and of erecting piers for intermediate supports, height required under the bridge, materials available, and aesthetic considerations. A B. is a permanent structure and should look like



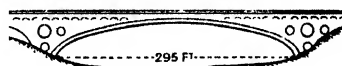
ST LOUIS MUNICIPAL

a natural element of its surroundings. A row of masonry arches over a riv. looks well in city surroundings; plate girders on cylindrical piers do not.

Girders (q.v.) are either plate girders with solid plates between the upper and lower flanges, which are then usually parallel, or lattice girders (trusses) of constant or varying height. The box girder forming a closed tube, used in the Britannia tubular B. (1850) over the

Menai Straits and the B. over the St Lawrence in Montreal, is now obsolete.

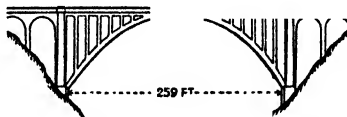
The Britannia tubular B. has 2 spans of 460 ft each and 2 of 230 ft, the traffic passing through 2 tubes side by side. It was built by Robert Stephenson, Hodgkinson, and Fairbairn, assisted by Clark, and estab. the superiority of wrought iron over cast iron. In 1859 was constructed Brunel's great B. at Saltash, having 2 spans of 453 ft. The top boom



PLAUNEN

is of hollow elliptical section, of cast iron, and arched from end to end. The bottom member of reverse arched form is of wrought iron, the two being braced with vertical and diagonal members. The B. is still in use.

In the accompanying diagrams indicating the forms of the various trusses, thin lines show members in tension, thick lines those in compression. The St. Louis municipal B. crossing the Mississippi has 3 spans each of 668 ft, carrying a double deck, with 2 railway



STEIN TEUFEN BRIDGE, SWITZERLAND

lines and a road for vehicular traffic and passengers. The girders are 110 ft deep at the centre, reduced towards the ends. The piers are founded on caissons, reaching rock at about 137 ft below high-water level.

Arches built of stone or brick are commonly used for short spans where labour and materials are at hand. The largest in England is the Grosvenor B., Chester, of 200-ft span (1833). The

Plauen B. (1903) spans 295 ft. Recently reinforced concrete (q.v.) has been much used; it is economical in first cost and maintenance. It is not, however, in railway work, adaptable to alterations or reconstruction, such as are frequently necessary with growth of traffic, or for other reasons, as no reinforced concrete structure is fit to carry its full load till many weeks after being built. The Stein Teufen B. in Switzerland is a fine

example, with a 259-ft span. The Sergolomento B. in Rome has a 328-ft span. The earliest attempt to use iron for an arched B. was made at Lyons (1755); the first carried to completion was the B. at Coalbrookdale, a semicircular cast-iron arch of 100 ft. still standing. Thomas Paine, author of *The Rights of Man*, having endeavoured in 1787 to secure the construction of a cast-iron arched B. over the R. Schuylkill, some of

B. between Norway and Sweden, which was completed in 1946, is the highest B. in Europe, being 200 ft above Svine Sund. It has a single span of 465 ft and a total length of 1260 ft. The Sydney Harbour B., which was designed by Ralph Freeman and opened in 1932, is the largest single-span arch B. in the world, its span being 1680 ft in length. The top of the arch is 445 ft above high-water level, while the roadway, which is suspended



COALBROOKDALE



SOUTHWARK

the ribs were cast at Rotherham and, the project being abandoned, the material was used for the arched B. of 236-ft span across the R. Wear at Sunderland, finished in 1796. Southwark B. over the Thames, by Rennie, completed in 1819, has 3 spans, the largest being of 240 ft. It was not till 1864 that a wrought-iron arch B. of importance was constructed, when a B. of 3 spans was built crossing the Rhine at Koblenz, having openings of 315 ft. The ribs are of openwork design

below the arch, is 170 ft above the water level, and being 150 ft wide can accommodate 6 lines of traffic, besides carrying 2 10-ft pathways. The total length of this B. is 3816 ft, including approaches. In England the 531-ft span of the new Tyne steel arch B. is the largest in the country. The clearance of 84 ft allows full headroom for the type of ships using the riv., and the height to the top of the arch is 200 ft.

Cantilever bridges, in which the struc-



VIAR



NIAGARA FALLS

rising a part of their height above the road level.

In 1874 was completed Captain Eads' great B. over the Mississippi at St Louis. This is of 3 spans, 502, 520, and 502 ft, the centre arch rising 47½ ft. The arches are formed of open triangulated ribs, supporting the roadway by vertical columns at the apices of the arch bracing. The general appearance is very fine. This is one of the earliest instances of the use of steel on large B. work,

ture of the B. is carried out from either side towards the middle of the opening, where the projecting ends are connected by an intermediate girder span, were in a crude form known in very early times by the Chinese, being constructed in timber. Of modern examples may be mentioned the Forth B. (1890) by Baker. This B. has 2 main spans of 1710 ft each. There are 3 cantilevers, connected over the prin. openings by independent girder spans of 350 ft. The length from end to



FORTH

though for small B.s it had been used in this country in 1861. Other B.s of importance are the Douro viaduct by Seyrig of 252-ft span, having crescent-shaped arches, hinged at the springing; the Viar B., France, of 722-ft span, having hinges at the crown and at the springing; and the Niagara Falls B., replacing in 1897 an earlier suspension B. The span of this arch, which is hinged at the springings only, is 840 ft. The

end of the cantilevered part of the B. is 5330 ft. The arrangement is stable and convincing in appearance. The great B. over the St Lawrence at Quebec, which is of cantilever form, has a centre span of 1800 ft, the cantilevers resting upon points, and deriving their whole stability from the land anchorages upon the shore. 1927 saw the opening of 2 important B.s—in May the cantilever B. over the Carquinez Straits, California, and in Aug.



Australian News and Information Bureau
 SYDNEY HARBOUR BRIDGE, FROM THE NORTHERN SIDE OF THE HARBOUR



Valentine and Sons Ltd, Dundee
 NEWCASTLE UPON TYNE: THE BRIDGES
 The Tyne bridge, the swing bridge, and the high level.

the International Peace B. between Buffalo, U.S.A., and Fort Erie, Canada. In 1927 also 3 B.s were put under construction to connect Staten Is. to the mainland. The Outer B. crossing, named after the first chairman of the port authority, from Perth Amboy, New Jersey, to Tottenville, Staten Is., is a high-level cantilever structure over Arthur Kill, being 135 ft above water as the Kills are navigable. Central span is 750 ft. and total length, including approaches, 10,200 ft. The other cantilever B. stretches from Elizabeth, New Jersey, to Howland Hook, Staten Is., with a centre channel span of 672 ft.

Suspension bridges. In modern times, one of the earliest B.s of note of this kind was the Menai suspension B., 1819, of 570-ft span, by Telford, and later suspension B.s are those crossing the East R. at New York, the Brooklyn, Manhattan, and Williamsburg, having centre spans of 1596, 1470, and 1600 ft respectively. The last has steel wire cables 18½ in. in diameter, dipping 176 ft, supporting a deck 118 ft wide. The great highway B. from Philadelphia to Camden over



QUEBEC

Delaware R., designed by Modjeski, was completed in 1926. Length between anchorages is 2253 ft and main span 1750 ft. Two suspension cables were used, each 30 in. in diameter, consisting of 18,666 wire strands. Main towers rise 385 ft above water. The great Hudson R. B. from New York City to New Jersey crosses the Hudson with a central span of 3500 ft, the weight of the suspended structure being 120,000 tons. This is the most striking modern Amer. B., with its steel towers 635 ft above high water and a clearance of 213 ft above high water at the centre so that the largest ocean-going ships can at all times pass beneath with their masts standing up. The essential object in the design of this B. was to allow of enlargement after the initial opening, so as to meet ever-changing conditions. Thus, though the floor has 2 decks the lower will probably not be in use for some years. The upper has a centre roadway 40 ft wide, to carry 4 lines of heavy traffic, and outside roadways 24 ft wide, and 2 footpaths 11½ ft wide. The towers, massive so as to express their function of supporting the tremendous weight of the suspended span, are each 210 ft wide and 65 ft long at the base. The engineer responsible for the Hudson R. B. is O. H. Ammann, formerly chief assistant to Gustav Lindenthal, who built the Hell Gate arch.

The Huey Long B. across the Mississippi, the latest of that riv.'s 29 major B.s, is 4½ m. in length, including its approaches, and is numbered among the world's

greatest B.s. It was opened on 16 Dec. 1935. Its central cantilever span has a total length of 799 ft from pier to pier, of which 500 ft comprise a suspended span supported by cantilever arms. A new B., over 8 m. long, begun in 1935, connects San Francisco with its suburb Oakland. Ships of any tonnage can pass under it. A still more striking B. is the new suspension B. across the Golden Gate, San Francisco. Its central span is 4200 ft long, with 2 side spans of 1100 ft each, giving a clearance of 225 ft, with towers 760 ft high.

Opening bridges, in which a part of the structure is temporarily removed to leave a clear opening over water, or to make a break in the road for purposes of defence, are many hundred years old, and in the early form consisted of means provided to raise by chains a short length of B. floor. **Swing B.s,** in which some part of the B. turns upon a pivot, the weight perhaps supported by rollers, are hardly more than a cent. old. This type is largely used, and has been applied to give a free opening of as much as 500 ft, as in the great swing span over the R. St Lawrence, carrying 2 railroads, a trolley track, a carriage road, and footways. A swing B. carrying 234 ft of the Bridge-water Canal crosses the Manchester Ship Canal (q.v.) at Barton; this has openings on either side of the central pier of 90 ft each. The weight of water carried is 760 tons, and the total turning weight 1350 tons. The ends are closed during turning by gates, and watertight connection to the canal ends proper is made by a rubber-faced wedge device operated by hydraulic rams. The heaviest swing B. in the world is believed to be the Sacramento double-deck B., which has a swing span of 390 ft and is operated by 2 80-h.p. electric motors, and, despite its great weight, can be opened or closed in 2½ min. In **Bascule B.s** the moving portion turns vertically about a pivot, rising till the opening is left clear. The arrangement may be single-leaf or double, as in the case of the Tower B. over the Thames, which has a centre opening of 200 ft, with 2 leaves each of 100 ft overhang meeting at the centre when down. In **Rolling B.s,** of which the Schertzer variety is best known, the opening part of the structure is formed with a rounded end suitably ballasted, upon which the opening part is caused to roll backwards till the span assumes an upright position, no longer obstructing the waterway. The heaviest opening B. of this kind, at Keadby in Yorks, is of 3000 tons weight.

Traverser bridges. That part of the structure crossing the space to be occasionally freed is made to roll bodily backwards, telescoping within itself, with suitable mechanical arrangements to meet the difficulty presented by coincidence of road surface on the moving and the fixed portions of the B. A structure of this kind crosses the R. Dee. **Transporter B.s,** of which many now exist, have an overhead arrangement of horizontal girders, or some form of stiffened suspension B., at a sufficient height to give

the desired headway, with a platform suspended therefrom, which, accommodating vehicular and passenger loads, is drawn across from side to side. Of this kind the Runcorn transporter B. over the Mersey, constructed by Webster, has a clear opening of 1000 ft. Formerly B.s used in military operations were constructed chiefly of timber, and were formed of plain or trussed beams, which might be supported by trestles. (Antiliver and suspension types are used for larger spans, and for crossing wide rivs. B.s are commonly of the floating description. The paramount condition is ability to erect quickly.

See also BRIDGING, MILITARY and FLOATING BRIDGE.

See H. H. Bird, *Practical Design of Plate Girder Bridges*, 1920; D. B. Steinmann, *Suspension Bridges*, 1922; W. J. M. Rankine, *Civil Engineering*, 1926; W. L. Scott, *Reinforced Concrete Bridges*, 1931; C. E. Inglis, *Vibration in Railway Bridges*, 1934; A. Morley, *Theory of Structures*, 1934; C. A. Claremont, *Spanning Space*, 1939; H. P. Philpot, *Lattice Girder Bridge*, 1939; A. C. Hayden, *The Rigid Frame Bridge*, 1940; G. A. Hool and W. S. Kinne, *Movable and Long-span Steel Bridges*, 1943; Ministry of Transport, *Memorandum on Bridge Design and Construction*, 1945; J. Husband and W. Harby, *Structural Engineering*, 1947.

Bridge, card game developed from whist and introduced about 1894. The cards are dealt as in whist. The dealer has the privilege of declaring what suit constitutes trumps, and he is influenced by the different scoring values of the various suits. Spades count 2 points for every trick above 6, clubs 4 points, diamonds 6 points, hearts 8 points, and no trumps 12 points. After considering his own hand, the dealer may leave the duty of declaring trumps to his partner, but no further communication than the bare words 'I leave it' is allowed. When trumps have been called, the 'leader,' or opponent on the left of the dealer, may 'double' the value of each trick, or, following him, the third player may exercise that right. In case of a double, the dealer or his partner may 'redouble,' which means that the value of a trick is quadrupled. This again may be doubled, and so on until a maximum of 100 points a trick is reached. After the leader has played his first card, the second player, or 'dummy,' lays his hand face upwards on the table and takes no further part in actual play, the dealer playing both hands. Otherwise play proceeds as in whist. The scoring is recorded on paper ruled with 2 vertical columns crossed by a horizontal line above half way. The values of tricks above 6 are scored below the line to either side, while above the line are scored honours, chicane, and points for grand and little slam. The honours consist of ace, king, queen, knave, and 10 of the trump suit, and for 3 or 'simple' honours a side scores the value of 2 tricks; for 4 honours, 4 tricks; for 5 honours, 5 tricks; for 4 honours in 1

hand, 8 tricks; for 5 honours, 4 in 1 hand, 9 tricks; for 5 honours in 1 hand, 10 tricks. In no trumps, aces are counted as honours, 3 counting 30 points, 4 counting 40 points, and 4 in 1 hand 100 points. 'Chicane' means the absence in 1 hand of any trump cards; the side possessing the hand scores points equivalent to simple honours. If all the tricks are taken, 'grand slam' is recorded, counting 40 points; if all but 1 are taken, 20 points are scored for 'little slam.' A game is concluded when 1 side completes 30 points below the line, and a fresh game starts. The first side to win 2 games is awarded the rubber, for which 100 points are scored in the honour column. The total score is arrived at by adding all points above and below the line.

Three-handed bridge. When 3 persons play, 4 hands are dealt, the dealer playing his own and dummy's. If the dealer 'leaves' the declaration, the trump is determined by the constitution of dummy's hand. If there are 3 aces, 'no trumps' must be called, otherwise the longest suit constitutes trumps. If 2 suits are of equal length, the pips are counted, ace counting 11 and other honours 10 each. If 2 suits are still equal, the suit of higher scoring value becomes the trump suit. Only declarations which are won are scored below the line; the opponents score above the line if the declaration is lost, together with honours, etc., as in ordinary B. 50 points are scored in honours for each game, and 50 more for the rubber. See also AUCTION BRIDGE and CONTRACT BRIDGE.

Bridge of Allan, burgh and holiday resort of Stirlingshire, Scotland, 3½ m. N. of Stirling, on R. Allan, situated on the lower S. slopes of the Ochil Hills. In the 1820's a spa developed around the Air-threy mineral springs, and B. of A. grew from a vil. to a small tn. It remains an attractive tourist centre. Bottle closures and stoppers are manuf. Pop. 3173.

Bridge of Sighs (It. Ponte dei Sospiri), name given to the covered bridge in Venice (q.v.) connecting the Doge's Palace with the State prison. The name refers to the fact that it was by way of this bridge that offenders under sentence of death were conducted to their fate.

Bridge of Weir, mkt tn in W. Renfrewshire, Scotland, 6 m. W. of Paisley, with a tanning industry. Pop. 3500.

Bridgeman of Leigh, William Clive Bridgeman, 1st Viscount (1864-1935), politician, educ. at Eton and Cambridge. He entered Parliament in 1906. In the Coalition Gov. during the First World War he was junior lord of treasury and parl. secretary in various depts. Privy Councillor 1920, home secretary in Conservative govs., 1922-4. On the Conservatives' return to power, Nov. 1924, he became first lord of the Admiralty, and was active in developing the project for the Singapore naval base. B. was created a viscount in 1929.

Bridgend, tn in Glamorganshire, S. Wales, on the R. Ogmore, in the centre of the vale of Glamorgan, 19 m. W. of

Cardiff. There are various small industries, but B. is prin. a mkt for the surrounding dists. Pop. 13,500.

Bridgenorth, see BRIDGNORTH.

Bridgeport, seaport and city of Fairfield co., Connecticut, U.S.A. It is situated on Long Is. Sound, and is about 65 m. N.E. from New York. It has a considerable coasting trade, and a safe harbour for small vessels. The state's chief manufacturing centre, B. produces electrical equipment, firearms, ammunition, brassware, sewing machines, typewriters, hardware, clothing, textiles, and aluminium. It is the site of B. Univ. and B. Engineering Institute. Pop. 158,700.

Bridges, Sir George Tom Molesworth (1871-1939), soldier, nephew of Robert B. (q.v.), the poet laureate. Artillery subaltern in 1892, reached the rank of major-general in 1917 and of lieutenant-general in 1922. In the First World War he commanded the 19th Div., head of military missions with Belgian Army, and to U.S.A. Governor of S. Australia, 1922-7. K.C.B., 1925. He pub. *Alarms and Excursions*, 1938.

Bridges, Robert Seymour, O.M. (1844-1930), poet laureate, b. Walmer. He was educ. at Eton, Corpus Christi College, Oxford, and later was a medical student at St Bartholomew's, London. For some time assistant physician at the Children's Hospital, Great Ormond Street, he afterwards was on the staff at the Great N. Hospital. Having ample private means, he retired from practice in 1882 to devote himself to literature. His knowledge of medicine and contact with suffering humanity undoubtedly account for the deep and subtle insight into the well-springs of human nature which characterises so much of his work, particularly in poems on the mystery of the body and the miraculous spirit of man. In 1894 he married Monica, daughter of Alfred Waterhouse, R.A., a love match which is often reflected in many of his earliest as well as latest love poems. In 1913, when he was appointed poet laureate in succession to Alfred Austin, many described him as an academic poet; but though he shunned publicity, his muse is not remote from human concerns, and if his poetry will never be 'popular', it often approaches the authentic in ecstasy and tenderness. His finished artistry, which mitigates the somewhat unmusical note of his more experimental quantitative hexameters and elegiacs, and deft workmanship, combined with real fervour, give him an unassailable place among our national poets as the link between the older and younger schools of Eng. lyrical poets. His finest work and that which most evidences his craftsmanship, is, perhaps, to be found in such poems as *Eros and Psyche*, his version of the love story of Apuleius, and in many of his sonnets. Other notable works are *Demeter: a Masque*, *The Spirit of Man* (an anthology in wartime), and *Prometheus, the Firegiver*. In prose, his essays on Milton's prosody and on Keats put him not far below Matthew Arnold, while he eschews the pessimism of the earlier critic. In the same period of his

highest activity, between 1885 and 1916, he also produced some 8 plays, all of the order of closet drama; and some loyal poems of the type of *Britannia Victrix*. The plays include a tragedy, *Nero*, written in 1885, and *The Return of Ulysses*, 1890, and a comedy, *The Humours of the Court*, in which he modelled himself on Calderon. In 1914 he produced a privately printed ed. of poems, entitled *October and other Poems*, which with some 18 war poems were pub. in 1920. In 1916 he pub. *The Spirit of Man*, a collection of prose and verse extracts from many writers, designed to bring fortitude and peace of mind to his countrymen in the dark days of the war. Another anthology, *The Chitwell Book of Poetry*, for use in schools, was pub. in 1924. Many of the best pieces in it—in a style which B. describes as 'New Miltonic'—are full of beauty and humour, often rich in philosophic suggestion. Included in the output of his later prose were a *Memoir of Henry Bradley* of the Oxford Dictionary, essays on Shakespeare's dramas, *Free Verse*, *Keats and Poetic Diction*. He also placed posterity in his debt by rescuing from oblivion the poems of Gerard Manley Hopkins (q.v.). His care for Eng. pronunciation led to his becoming an adviser to the B.B.C. on the subject. He was also the founder and general editor of a series of studies in the Eng. language known as the S.P.E. Tracts. It was at the age of 85 that he pub. his great poem, *The Testament of Beauty*, which has been well described as a personal synthesis to the making of which had gone all the scientific, artistic, philosophical, and religious energies of a great nature. It was in the year of the pub. of this poem, 1929, that he received the Order of Merit. See A. Symons, *Studies in Prose and Verse*, 1904, and E. Thompson, *Robert Bridges*, 1944.

Bridges, Sir William Throsby (1861-1915), Brit. general, b. Greenock. Educ. at Hyde, Isle of Wight; Royal Naval School, Greenwich; then—his parents having removed to Canada—at Trinity College School, Port Hope, Ontario, and at the Canadian Military College, Kingston. His parents having again removed, he followed them to New S. Wales and obtained a position in the Gov. Roads and Bridges dept. Became lieutenant in New S. Wales permanent artillery, 1885. Served in S. Africa, 1899-1900; Acting Q.M.G. H.Q. Commonwealth military forces, 1902; chief of intelligence, 1905; chief of general staff, 1909; and from 1910 till 1914 commandant Royal Military College, Duntroon, which he had founded. During the First World War he was with the first Australian contingent as major-general; and, while commanding the first Australian div. at Gallipoli, he was mortally wounded and d. at sea soon after.

Bridget, St. of Sweden (c. 1304-73), daughter of Birger Persson, Governor of Uppland, and of the blood-royal of Sweden. She was married to Ulf Gudmarsson at the age of 14, and 8 children were b. of the marriage. After her husband's death she founded at Wadstena

(1344) the Order of the Most Holy Saviour, known as 'the Brigittines,' which quickly spread its influence throughout Europe. At S. Brent (Devon) is the famous Brigittine nunnery of Syon House. St B. was canonised in 1391; her feast is on 8 Oct.

Bridget, St. of Kildare, see BRIGIT, St.

Bridgeton, city and co. seat of Cumberland co., New Jersey, U.S.A. It is a port built on Cohamsey Creek, about 40 m. from Philadelphia. B. is the shipping and trade centre for an agric. region; it manufs. glassware, metal products, and underwear. There is an 18th-cent. Presbyterian church. Pop. 18,300.

Bridgetown, cap. of Barbados (q.v.), Brit. W. Indies, deriving its name from a bridge found by the first settlers. Situated on Carlisle Bay, B. is a flourishing city and port. In 1665 the Dutch Adm. de Ruyter attacked B. in vain for 5 hrs. Père Labat, the celebrated Dominican father, visited the tn in 1700 and described it as handsome, with straight, broad, clean, and well-planned streets. The public buildings are an imposing group, built of locally hewn coral rock. St Michael's Cathedral, also built of coral, lies to the E. of them, on the site of a church erected in the 17th cent. which was destroyed in a hurricane in 1780. The cost of the new cathedral was defrayed by a lottery sanctioned by the legislature. George Washington's House, the lodging which the Amer. statesman and his invalid brother occupied on their visit in 1751, is of historical interest. Trafalgar Square (formerly called the Green) has a statue of Nelson. St Anne's Fort, a quaint fort facing the bay, was erected in 1703 by Sir Nevill Granville in honour of Queen Anne. Codrington College (founded 1710) lies 10 m. from the tn; it is affiliated to the Univ. of Durham in England. Sugar, molasses, rum, and cotton are the chief exports. Pop. (B. and environs) 68,920.

Bridgewater, Francis Egerton, 3rd Duke of (1736-1803), introduced inland navigation in England. During his young days he became engaged to the Duchess of Hamilton, but the match was broken off. This caused his retirement from society, and he estab. a house in the country, where he studied the possibilities of canal traffic. He designed the canal from Worsley to Manchester so that it might be utilised for the transport of coal from his Worsley estate. A remarkable aqueduct across the Irwell is a feature of the great achievement. With the aid of his engineer, James Brindley, he projected the canal connecting Liverpool and Manchester. This was begun in 1762, and manifold and formidable obstacles had to be surmounted. The canals were sold to the B. Navigation Co. in 1872, and in 1887 were sold to the Manchester Ship Canal Co.

Bridgewater, Francis Henry Egerton, 8th Earl of (1756-1828), son of John Egerton, Bishop of Durham. He was educ. at Eton and Oxford. He studied for the Church, and was rector of Middle and Whitechurch, in Shropshire. He succeeded his brother to the title in 1823, but remained unmarried, and at his death the title became extinct. The Egerton

MSS. (on the literature of France and Italy) were bequeathed by him to the Brit. Museum along with a sum of £12,000. He also left £8000 to be paid to the author of the best treatise 'On the Power, Wisdom, and Goodness of God, as manifested in the Creation.' The president of the Royal Society (Davies Gilbert), in whose hands lay the decision of the merits of the works, divided the money among 8 persons for 8 separate treatises. These are the celebrated B. Treatises. The list of the works is as follows: (1) *The Adaptation of External Nature to the Moral and Intellectual Constitution of Man*, by Thomas Chalmers, D.D., 1833; (2) *Chemistry, Meteorology, and Digestion*, by Wm Prout, M.D., 1834; (3) *History, Habits, and Instincts of Animals*, by Wm Kirby, 1835; (4) *Geology and Mineralogy*, by Dean Buckland, 1837; (5) *The Hand, as enacting Design*, by Sir Charles Bell, 1837; (6) *The Adaptation of External Nature to the Physical Condition of Man*, by John Kidd, M.D., 1837; (7) *Astronomy and General Physics*, by Wm Whowell, D.D., 1839; (8) *Animal and Vegetable Physiology*, by Peter Mark Roget, M.D., 1840.

Bridgewater Canal, one of the first Eng. canals to be constructed (1755), was built by the order and at the expense of the Duke of B. for conveying coals from Worsley to Manchester. The work was successfully accomplished by Brindley. There are immense embankments on the old canal, and viaducts and bridges: 2 branches went from the Mersey at Runcorn Gap, one going to Manchester, the other to Pennington. The length was 40 m., and the fall 2 ft in a mile; the waterway was 5 ft deep and 52 ft wide. It was later extended to the Mersey. See BRIDGEWATER, DUKE OF and MANCHESTER SHIP CANAL.

Bridging, Military. Before the introduction of heavy armament light bridges of wood, rope, basket-work, etc., sufficed, while various types of rafts and flat-bottomed boats were used for the transport of horses and wagons. During a campaign material may have to be carried considerable distances, a consideration which affects choice of materials. Before the First World War military bridges were constructed almost entirely of wood, but owing to the development of heavy field artillery during the present cent., combined with the invention and use of tanks and of mechanical transport generally, the use of iron and steel became necessary. The demolition of bridges is one of the most effective means of delaying the enemy or denying to him the use of certain lines of approach or of restricting his activities to a certain area. At the beginning of the First World War the lack of heavy B. material was felt acutely by the Brit. Army when crossing the R. Aisne. Steel spans were, however, soon sent to France from England. As the war progressed lifting bridges for use on canals, and barge bridges, were also constructed; the latter were useful in spanning 60-ft gaps, the barge being turned in the required direction. The successful Ger. advance in the spring of

1918 caused many bridges to be built on the new front, in which a number of rolled-steel joist spans were erected over sev. small streams about St Omer. Much B. work was carried out during this period by the Amer. engineers in the Amiens area. In Aug. 1918 the Australian pioneers also distinguished themselves by erecting 2 high-level bridges at Chipilly. The Americans generally adopted the Brit. type of bridge, and produced a pattern with a 60-ft span in which the cross girders and flooring were raised to allow the sponsons of tanks to ride over the girders.

Sir D. Bailey, a Brit. engineer, gave his name to a bridge which was of the utmost value to the Brit. and Amer. armies in the Second World War, and became a standard method of bridge construction. The bridge, which is of steel, provides an equipment which can be assembled rapidly by hand in various ways in order to meet varying requirements of span and load. The roadway of timber planking is carried between 2 main girders. These girders are formed of steel lattice 'panels,' each 10 ft long by 5 ft 1 in. high, pinned together with alloy steel pins. The panels are designed to be handled by 6 men, and the bridge is normally built on rollers and pushed out across the gap as each set of panels with cross members and stiffening pieces is assembled. The strength of the main girders is varied by adding extra panels alongside the first and/or by adding extra storeys above. The bridge can be constructed to carry all military loads, including trains. A single span can extend over a gap of up to 250 ft. The equipment is also designed for use with pontoons as a floating bridge. See also ENGINEERING, MILITARY. See Institution of Civil Engineers, *The Civil Engineer in War*, vol. 1, 1948.

Bridgman, Laura (1829-89), Amer. blind deaf-mute, b. Hanover, New Hampshire. Up to the age of 2 the child was organically normal, but she caught a severe fever, which utterly destroyed her senses of hearing and seeing, and seriously impaired her nervous system. At the age of 8, through the influence of Dr Howe, she was admitted into the Perkins Institution for the Blind, Boston. At first her intellect could only be reached through arbitrary signs, but gradually she mastered the art of reading in embossed type, and thenceforth made extraordinary progress. She subsequently learned advanced algebra, geography, and elementary astronomy. She was of a very religious temperament, and wrote sev. little hymns. She was the first blind deaf-mute for whom a systematic education was successful. Charles Dickens met her, and gives an account of her education in his *American Notes*, Chap. III.

Bridgman, Percy Williams (1882-), Amer. physicist, b. Cambridge, Massachusetts. Studied at Harvard, where he became prof. in 1912. He has made studies of many phenomena at very high pressures, up to 100,000 atmospheres. He was awarded the Nobel prize in 1946.

Bridgnorth, tn and municipal bor. of

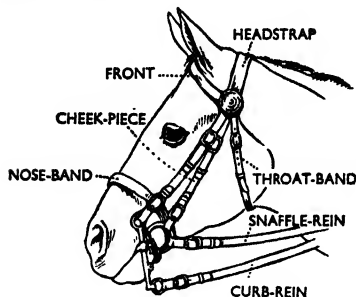
Shropshire, England, 14 m. SSE. of Wellington, picturesquely situated in the valley of the Severn, which divides it into the High and Low Towns. High Town, with its famous Castle Walk, is situated on a cliff overlooking the riv. It is an important market centre in a rich agric. area and possesses an anct tn hall, a library, and buildings of historical importance. Its industries are carpet-making, light engineering, radio, and electronics. Pop. 6250.

Bridgwater, seaport tn in Somerset, England, some 30 m. from Bristol, an anct bor., rich in historical associations. The R. Parrett flows through the middle of the tn and is spanned by a fine iron bridge. A variety of industries is carried on, including the manuf. of bricks, tiles, 'Bath' scouring brick (made from silt from the riv. bed), shirts and collars, wicker work, furniture, preserves, transparent cellulose film wrappings, general and electrical engineering. Pop. 23,340.

Bridie, James, pseudonym of **Osborne Henry Mavor** (1888-1951), dramatist, b. Glasgow. He was educ. at Glasgow Academy, High School, and Univ., where he ed. the *University Magazine*. Qualifying as a doctor, he practised in Glasgow till 1938, and was for a time prof. of medicine in the Anderson College. He first became famous with his play *Tobias and the Angel*, which ran in London with great success. Others of his plays are *The Anatomist*, 1930, *Jonah and the Whale*, 1932, *A Sleeping Clergyman*, 1933, *Susannah and the Elders*, 1937, *Mr Bolfray*, 1943, *The Forrihan Reel*, 1944, *John Knox*, 1947, *Dr Angelus*, 1947, and *The Queen's Comedy*, 1950. A founder of the Glasgow Citizen's Theatre, he was made a C.B.E. in 1946. Reminiscences of his life are contained in his book *One Way of Living*, 1939.

Bridle, that portion of the harness of a horse by means of which its direction is governed and its speed regulated. It is attached to the head and mouth. The ordinary single riding B. consists of a system of straps, one passing over the head, behind the ears, called the head-strap; another, the front strap, in front of the ears, and horizontally placed and joining the head-strap at each end; other portions include a cheek-piece, throat-band, nose-band, and the reins, all of which are explained by the names they bear. The driving B. has usually a pair of blinkers fixed to the cheek-pieces in order to restrict the vision of the horse, for its tendency to see objects approaching from the rear often leads to fright. Another variety of the B. is the double or Weymouth B., and is generally used in hunting, though its use in ordinary driving is increasing. It has 2 separate bits, and is to be recognised by its chain curb, which gives additional powers of control. A modification of this double B. is the Pelham. It consists of a single bit with an additional pair of rings fixed to the sides. Improvements regarding the appearance of the horse and also its physical comfort have seldom happily been made to achieve both ends. The bearing-rein,

fastening to the saddle-pad and thence to the bit, has the effect of arching the animal's neck and thereby considerably improving its appearance, but the physical discomfort entailed by the device is claimed by the opponents of the bearing-rein to render its application wilful torture. The modern bit, called a snaffle bit, consists of a smooth rounded iron, joined in the centre, and terminating in bars as a preventive against the bit being pulled out of the mouth, and it is noteworthy that it corresponds in structure almost exactly with the Assyrian device.



Bridlington, municipal bor. and seaside resort in the E. Riding of Yorks, England, sheltered by Flamborough Head 6 m. away. The priory church, once part of an Augustinian foundation, has interesting stained glass. Queen Henrietta Maria's lodgings were cannonaded here in 1643 by Adm. Batten, and shots from an Amer. squadron reached the shore in 1779. B. is the H.Q. of the Royal Yorks Yacht Club, and there is plentiful harbour accommodation for small vessels. It possesses one of the largest municipally owned entertainment undertakings in Britain, the premises being extensively used for conferences. Pop. 24,500.

Bridport, Sir Alexander Hood, 1st Viscount (1727-1814), Eng. admiral, son of a clergyman and brother of Viscount Hood of Whitley (q.v.). He entered the navy in 1741, and served as lieutenant for 10 years in a number of ships. Whilst on the *Minerva* frigate he was at Quiberon Bay when Hawke gained his famous victory, 1759. In 1778, in the *Robust*, he took part in the battle of Ushant. The court-martial of Adm. Keppel resulted from this engagement. B., by his defence of Keppel, roused considerable animosity. As commander of a flag-ship under Howe, he was present at the relief of Gibraltar in 1782. When war was declared with France in 1793, he distinguished himself, especially in the action known as the 'Glorious First of June,' as second in command to Howe, and was consequently raised to the Irish peerage. In 1796-7 he controlled the war from

London, whilst from 1798 to 1800, after the suppression of the mutiny at Spithead, he directed the siege of Brest, until St Vincent relieved him.

Bridport, bor. of Dorset, England, situated between the 2 rivs. Brit and Asker, 1 m. from the sea. B. forms a mkt tn and centre for a wide area. In 1253 Henry III granted a charter making B. a royal bor., and it is mentioned in Domesday Book. Ropes, twines, nets, and cordage of all kinds are made. At W. Bay there is a harbour which receives small shipping and is a holiday, boating, yachting, and fishing centre. Pop. 7000.

Brie, Simon de, see MARTIN (Popes), *Martin IV.*

Brie, agric. dist. of N. France, part of the anct prov. of Champagne (q.v.), lying between the Seine and Marne rivs. It is in 2 parts, W. and E., which are respectively known as the B. pouilleuse and the B. champenoise, the cap. of the latter being Meaux (q.v.). Area 2400 sq. m.

Brie-Comte-Robert, Fr. tn in the dept of Seine-et-Marne, once cap. of Brie (q.v.). It has a fine church, partly 13th cent. Glass is manuf. Pop. 3000.

Brief, in Eng. law, the written document on which as basis barristers advocate causes in courts of justice. The B. is a concise statement of the information procured by the solicitor with regard to witnesses, evidence, etc., and such comments on the case as the solicitor thinks necessary. The B. is endorsed with the title of the court and the action, and bears the name of the solicitor and of the counsel. On receiving the B. the barrister has authority to act for the client throughout the case. In Scotland the legal term corresponding to B. is memorial.

Brief (Church Brief or King's Letter), an obsolete instrument issued under the privy seal in the form of an open letter in the king's name which licensed the petitioners for the B. to collect money for charitable purposes therein specified. It was addressed to the archbishops, bishops, clergymen, magistrates, churchwardens, and overseers of the poor throughout England, who were enjoined to assist in such collection. A statute was passed in Queen Anne's reign to check abuses of B.s, which were abolished in the time of George IV because the cost of collection nullified the benefit to charity.

Brief (or Breve), Papal, term used to denote papal documents which are drawn up without the full ceremony which the bull (q.v.) necessitates. The B. is furnished with a red wax stamp showing St Peter drawing in a net and surmounted by the name of the pope ('the ring of the fisherman'). The B. was instituted to lessen the work of the papal chancery, hence the name.

Brieg, see BRZEG.

Brielle (Briel), small seaport in the prov. of S. Holland, in the Maas estuary, Netherlands, about 14 m. W. of Rotterdam. It has a good harbour, an arsenal, powder magazines, and barracks. The high tower of St Catherine's Church is used as a lighthouse. B. was captured by the 'Sea Beggars' in 1572, during the

struggle with the Spaniards. (See also NETHERLANDS, *History*.) The inhab. are chiefly fishermen and pilots. Pop. 3700.

Brienne-le-Château, Fr. tn in the dept of Aube, on the Aube. In 1779-84 Napoleon was a student in the military school formerly here, and on 29 Jan. 1814 he defeated Blücher near by. The church is partly 12th cent., and there is an 18th-cent. château. The tn has breweries. Pop. 1900.

Brienzen, vil. in the canton of Bern, Switzerland, and the centre of the Oberland wood-carving industry. It is picturesquely situated on the N.E. of the lake of B., at the foot of the Brienzergrat Mts. The lake is 9 m. long and 3 m. wide and is formed from the R. Aar. Its waters are deep, and surrounded by beautiful scenery.

Brierfield, urb. dist. of Lancs, England, 2 m. from Burnley. Pop. 7050.

Brierley, Benjamin (1825-95), Brit. silk-weaver and writer in Lancs dialect. He educ. himself in his spare time, and began contributing articles to local papers in 1855. His sketches of Lancs character attracted attention. In 1863 he gave up silk-weaving and took the post of sub-editor of the *Oldham Times*, publishing *The Chronicles of Waterlow* in the same year. He completed his first long story, *The Layrock of Langley-side* (afterwards dramatised), in 1864. In 1869 he started *Ben Brierley's Journal*, a weekly, continued till 1891. Under the pseudonym Ab-o'-th'-Yate, he wrote *Tales and Sketches of Lancashire Life, Irkdale, and Ab-o'-th'-Yate in Yankee-land*. He visited America 1880 and 1884. A statue was erected to him in Queen's Park, Manchester, after his death.

Brierley Hill, tn and urb. dist. of S. Staffs, England, now including the former dists of Kingswinford and Quarry Bank, 10 m. W. of Birmingham, and on the edge of the Black Country. B. H. has one of the largest bacon factories in the country and a large steelworks. Amongst a wide variety of other products are its famous table-glass-ware, seeds, fire-bricks, hollow-ware, decorative tiles, and chains and anchors. Pop. 48,943.

Brierly, Sir Oswald Walters (1817-94), marine painter. He entered Sass's art school in London, then studied naval architecture at Plymouth, and exhibited some ship drawings at the Royal Academy, 1839. He travelled with Benjamin Boyd in the *Wanderer*, and settled in Auckland for 10 years. Brierly Point is called after him. B. voyaged in the *Rattlesnake*, 1848, and in the *Meander*, 1850, with Sir Henry Keppel, whose book about this cruise he illustrated, 1853. He was with Keppel during the Crimean War. In 1855 B. pub. lithographs, 'The English and French Fleets in the Baltic'; 1856, he took sketches of the naval review at Spithead for Queen Victoria and was attached to the suites of the Duke of Edinburgh and the Prince of Wales on their tours by sea, 1867-8; appointed marine painter to the queen, 1874; knighted, 1885. His best pictures are at Melbourne and Sydney. In 1881 he

was curator of the Painted Hall, Greenwich. Two famous works are 'The Retreat of the Spanish Armada,' 1871, and 'The Loss of the *Revenge*,' 1877.

Briesen, see WABREŻNO.

Brieux, Eugène (1858-1932), Fr. dramatist, b. Paris. He held influential positions on the staffs of *La Patrie*, *Le Figaro*, and *Le Gaulois*, but did not establish himself as a playwright until his *Ménage d'artistes*, 1890. He freely introduced philosophical discussions into his plays, which are, for the most part, satires on various social evils. To-day his works have lost much of their interest. Thus in *Blanchette*, 1892, he exposes the dangers of educating girls of the working classes; in *Les Trois Filles de M. Dupont*, 1897, he throws into bold relief the grave difficulties arising from the antiquated system of dowry; *La Robe rouge*, 1900, discloses the injustices of the law; *Les Avariés*, 1901, is about syphilis; *Maternité*, 1903, concerns social hypocrisy in the matter of motherhood. *Maternity, Damaged Goods* (Fr. title *Les Avariés*), and *The Three Daughters of M. Dupont* were pub. in England; the vol. having a preface by George Bernard Shaw, who saw in B. the most considerable Fr. playwright since Molière. Among B.'s later works are *Les Hameçons*, showing up the absence of freedom in 'free love,' 1906; *La Femme seule*, a feminist play, 1913; *Le Bourgeois aux champs*, on the incompatibility of bourgeois and peasantry, 1914; *Les Américains chez nous*, post-war comedy of old-fashioned France and new America, 1920. See P. V. Thomas, *The Plays of Eugène Brieux*, 1915.

Brieve, see BREVE.

Briey, Fr. tn, cap. of an arron., in the dept of Meurthe-et-Moselle. It is in a rich iron-producing dist. Pop. 2900.

Brig, 2-masted, square-rigged vessel. It was at one time a flat open boat with sails, and from 10 to 15 oars on each side, carrying about 120 men. A brigantine, or hermaphrodite B., is a small 2-masted vessel, square rigged on the foremast only, the other sails being fore-and-aft sails.

Brigade, military formation consisting of a group of arms and services under the command of a brigadier. The Brit. infantry B. consists of 3 battalions. In addition to infantry B.s the Brit. Army has armoured and parachute B.s. Besides its use to describe a formal group of military units the term has also been employed in connection with bodies of troops of a special character, e.g. the Irish B.s in French and Boer service, the Household B. (the Life Guards, the Horse Guards, and the Foot Guards), and individual regiments (the Rifle B.). The Brit. Artillery B. has now been replaced by the artillery regiment.

Brigade Major, officer, according to Eng. military usages, acting for the brigadier as does the adjutant for the C.O. of an ordinary regiment. He thus undertakes the corresponding duties of the brigade, having under him a staff of clerks, inspectors guards, and directs movements. In the Brit. Army such offices are

held at camps of exercise (e.g. Aldershot), or during active service and manoeuvres. The officer resumes his ordinary duties when his services as B. M. are no longer required.

Brigadier, rank in the Brit. Army held by the commander of a brigade, formerly B.-General. In 1920 the title of B.-General was abolished in the Brit. Army, and 'Colonel-Commandant' substituted; but in 1928 the title of Colonel-Commandant was abolished and 'Brigadier' substituted. The title B.-General is still in use in the Amer. Army. A B. in the Fr. Army is a corporal.

Brigandine, so called from the brigands, was the term used for a coat or body garment, lined with small plates or scales of iron, as a form of armour (q.v.), more flexible than the solid breastplate used in the Middle Ages. It was usually covered with cloth, and the rivets fastening the plates were visible on the outside, often gilt for decorative effect upon velvet.

Brigands, name originally applied to mercenary or irregular troops. The word has become degraded in meaning and is now used to designate bands of outlaws who live by rapine and plunder. B. have usually been found to be malcontents or the remnant of a people whose country has been overrun by invaders. Notable B. were Spartacus and his gladiatorial bands in anc't Italy, the later B. of Italy and Spain, the Scottish raiders, Australian bushrangers, and the dacots of Asia. Mountainous countries have ever been favourable to the practice of brigandage. Competent rural police have crushed the vice out of most civilised countries; but in Corsica, as well as in the remoter parts of Sicily, the Balkans, and Turkey, the practice is by no means yet extinguished. Brigandage has been a favourite topic of romance, but the great majority of B. when judged impartially are unromantic types of character.

Brigantes (from Celtic, meaning mountaineers), tribe of people inhabiting N. Britain between the Forth and the Humber before the Rom. conquest. Eboracum (York) was their chief tn, and Ostorius Scapula was the first Roman to come into contact with them, defeating them during the reign of Claudius. They were not thoroughly subdued till the reign of Antoninus Pius. They had an eponymous goddess whose name was Brigantia, and mention of her is found in various inscriptions. A branch of the B. settled in SE. Ireland.

Brigantia, see BRAGANCA.

Brigantine, see BRIG.

Brigantium (Austrian tn), see BREGENZ.

Brigantium (Fr. tn), see BRIANÇON.

Brigantium Flavius, see BETANZOS.

Briggs, Charles Augustus (1841-1913), Amer. divine, was minister of the Presbyterian church of Roselle, New Jersey, 1870-4, and from 1874 was prof. at the Union Theological Seminary. He was a famous Heb. scholar. For 10 years he was editor of the *Presbyterian Review*, 1880-90. In 1892 he was tried by the New York Presbytery on a charge of heresy, and acquitted; but the general

assembly of the denomination, on appeal, condemned him and suspended him from the ministry. He had questioned the truth of certain statements in the O.T., and exposed the falsehood of some scriptural tradition. In 1899 he became a priest in the Protestant Episcopal Church.

Briggs, Henry (1561-1631), mathematician. He was a native of Yorks, and b. Warley Wood, near Halifax. In 1581 he obtained his degree at St John's College, Cambridge, and 7 years later a fellowship. He was appointed reader of the physical lecture founded by Dr Thomas Linacre. His work on logarithms brought him into close personal contact with John Napier, whose hyperbolic form had till then sufficed. B. proposed the alteration of the scale from the hyperbolic form to that in which ten is the base. At the end of the second visit to Napier the new system was pub. in 1617. He received the appointment of Savilian prof. of geometry at Oxford in 1619. In 1624 he produced his stupendous *Arithmetica Logarithmica*, a work containing the logarithms of 30,000 numbers worked to 14 places of decimals. He d. on 3 Jan. 1631. His life was noted for its abstemiousness, studious application, and contentment.

Briggs, Henry Perronet (1793-1844), Eng. painter, studied at the Royal Academy and specialised in historical subjects, though, after he became an R.A. in 1832, he painted many portraits, that of Lord Eldon being considered his best. His 'Juliet and the Nurse' is in the Tate Gallery.

Brigham Young University, educational institution for students of both sexes founded at Provo, Utah, in 1875 under the auspices of the Church of Jesus Christ of Latter-Day Saints. Students in 1955, 7700.

Brighouse, municipal bor. in Yorks (W. Riding), England, 4 m. ESE. of Halifax. Prin. industries are the manuf. of woollen and silk textiles, engineering, and carpet weaving. Pop. 31,000.

Bright, Sir Charles Tilston (1832-88), civil engineer. In 1853 as engineer to the Magnetic Telegraph Co. he superintended the laying of the first deep-water cable between Great Britain and Ireland, from Portpatrick (Scotland) to Donaghadee (Ireland). B. organised with Field and Brett the Atlantic Telegraph Co., 1856, himself becoming chief engineer. After 2 disappointments, he succeeded in laying a submarine cable connecting Ireland and Newfoundland, thus being first to establish communication by telegraph between Europe and America. The first cable failed after working 68 days. Later B. laid cables in the Mediterranean, Persian Gulf, and W. Indies. With Clark he discovered improved methods of insulating submarine cables. Their paper on electrical standards caused the formation of the Brit. Association Committee on the subject. B. was knighted, 1858; in 1865-8 was Liberal M.P. for Greenwich. See the life by his son (revised ed., 1908).

Bright, John (1811-89), statesman and orator, b. Rochdale. His father, Jacob B., was a mill-owner there and a member

of the Society of Friends. He entered his father's business, and, as a nonconformist, took an active part in local politics, and also in the temperance movement, in connection with which his first public speeches were delivered. In 1837 he met Cobden, who was then beginning to speak against the Corn Laws, and very soon joined him, serving on the Manchester committee which founded the Anti-Corn Law League in 1839. In 1843 B. was elected M.P. for Durham on a free trade platform. At that time Sir Robert Peel's 'sliding scale' was in force, by which the price of wheat was not allowed to fall below a certain point, roughly speaking 60s. per quarter. The Anti-Corn Law League were determined on getting rid of the duty entirely, but were making slow progress until they were seconded in 1845 by a terrible ally, the famine in Ireland caused by the potato disease, which forced Peel first to resign, then to return as the leader of what was practically a Free Trade ministry. In 1846 the Corn Laws were repealed, and the Anti-Corn Law League was dissolved. In 1847 B. was elected for Manchester without opposition. In 1852 he was again returned for Manchester, and took part in the memorable vindication of Peel's policy, when Disraeli's attack was decisively defeated. He fought hard against the advocates of the Crimean War, also against Palmerston's action in China and Persia, and was consequently defeated at Manchester in April 1857, but in Aug. was returned at Birmingham without contest. In 1858 he took a leading part in the admission of Jews to Parliament, and in the transfer of the gov. of India from the E. India Co. to the Crown. During the Reform agitation from 1859 to 1867 he was one of the leading speakers, and was a chief factor in the return of the Liberals to power under Gladstone in 1868, when he was made Privy Councillor and president of the Board of Trade. For 4 years he was kept out of Parliament by a serious illness, but in 1873 came once more to the front as chancellor of the duchy of Lancaster. In 1875 he was chairman of the party meeting which elected Lord Hartington as leader on the retirement of Gladstone, and in 1878 took an impressive share in the debates on the Russo-Turkish war. His severance from Gladstone began on the Egyptian question in 1882, but was not complete until 1885-6, when he defeated Lord Randolph Churchill at Birmingham by a large majority, and helped to crush the Home Rule Bill. In 1883 he spoke strongly of 'the Irish rebel party,' and accused them of having exhibited 'a boundless sympathy for criminals and murderers.' At the election of 1886 his influence was predominant in securing the defeat of Gladstone. B.'s sincerity in political life, as in everything else, was passionate and convincing, and he was one of the greatest orators of his age. His conscientious examination of even the most minor issues, his absolute refusal to give way on principles, sets him in the forefront of eminent Victorian nonconformist politicians.

See *Speeches on Questions of Public Policy*, ed. by J. E. T. Rogers (2 vols.), 1858; *Public Addresses*, ed. by J. E. T. Rogers, 1879; *Public Letters*, ed. by H. J. Leech, 1885; G. M. Trevelyan, *Life of John Bright*, 1925; M. E. Hurst, *John Bright*, 1946.

Bright, Mary Chavelita, see EGERTON, GEORGE.

Bright, Richard (1789-1858), b. at Bristol. He studied medicine at Edinburgh, Berlin, Vienna, and Guy's Hospital; M.D., Edinburgh, 1813. Two years later he travelled extensively in Hungary, and in 1818 pub. *Travels from Vienna through Lower Hungary*, an excellent account of the social and economic life of that country. In 1820 he was appointed assistant physician to Guy's Hospital and full physician in 1824, remaining with that hospital for the rest of his life. In 1827 he pub. his *Reports of Medical Cases*, giving the first account of his classical researches on the association between kidney disease, dropsy, and albuminuria, and clearly defined the disease now known by his name. He was F.R.C.P. in 1832 and was appointed physician-extraordinary to Queen Victoria in 1837.

Bright, Timothy (c. 1551-1615), physician, clergyman, and inventor of modern shorthand. He took the degree of M.D. at Cambridge, his medical works showing remarkable knowledge of the doctrines of early Gk writers. Queen Elizabeth gave him livings of Methley, 1591, and Barwick-in-Elmet, 1594, in Yorks. His *Treatise of Melancholie*, 1586, possibly suggested Burton's more famed *Anatomy*. B.'s *Characterie*, a method of 'short, swift, and secret writing,' 1588, is only partly alphabetical. Willis's *Stenography*, 1602, is the real precursor of our modern systems. See also SHORTHAND. See *Shorthand*, 1884, and Lewis's *History of Shorthand*, 1815.

Brightingsea, seaport and par. in Essex, England, situated 8 m. to the SE. of Colchester. It is on the R. Colne, at its estuary. It has important oyster fisheries. Pop. 4501.

Brightman, Frank Edward (1856-1932), liturgicalist and historian, b. Bristol, educ. at Bristol Grammar School and Oxford Univ. Ordained deacon, 1884, and became one of the librarians of Pusey House. He was an examiner in theology in 1890, and, in 1902, made a prebendary of Lincoln. He was the foremost liturgical scholar of his day in England, and his *Liturgies, Eastern and Western*, and his *English Rite*, 1915, proved him to be without a rival in this branch of learning. He was a first-rate historian, and both archbishops Temple and MacLagan used his learning in the *Responsio* to the bull *Apostolicæ Curæ* of Leo XIII in 1897. But B.'s main interest was not in controversial theology, for he contributed many valuable articles to the *Dictionary of Church History*, 1912, notably on the hist. of the prayer book. He disliked the deposited book of 1927, and was strictly loyal to the old prayer book. (Consult on this his criticisms in *Church Quarterly Review*, July 1927.) Other writings

include a study of Bishop King of Lincoln, 1912, eds. of Andrew's *Preces Privatae*, 1903, and *Manual for the Sick*, 1909.

Brighton, popular watering-place of Sussex, England, 51 m. S. of London. The old name of the tn was Brighthelmston, which was corrupted about the beginning of the 19th cent. into B. The popularity of the tn as a watering-place was not assured till 1782, when the Prince of Wales spent a holiday there in the company of the Duke of Cumberland. The prince found the climate agreeable, and built the pavilion there in 1784 and took up a yearly residence in the tn. Brighton was made a parl. bor. in 1832, and a municipal bor. in 1854. The buildings of the tn are imposing. In 1849 the pavilion, which is said to have cost £1,000,000, was purchased by the tn for £50,000, and is now utilised as a museum, picture galleries, assembly room, and concert hall. The concert hall is known as the Dome; it can accommodate 3000 people. The streets are of substantial modern architecture. The promenade is magnificent and extends along the coast for about 4 m. A terrace of the finest houses in B. fronts the sea. There are 127 places of worship in the tn, of which the Holy Trinity Church is famous owing to the preaching of F. W. Robertson. Outside that of St Nicholas is the tomb of Nicholas Tattersell, the skipper of the collier in which Charles II escaped to France in 1651. The museum of Brit. birds containing the collection bequeathed by E. T. Booth was opened in 1893. It is the finest collection of Brit. birds in the world. The schools of B. are numerous and good, notably B. College. Roedean is a famous school for girls. The tn has many charity institutions, and the co. hospital is 'open to the sick and lame poor of every country and nation.' B. has no maritime trade; there are, however, considerable mackerel and herring fisheries. The water supply is derived from the chalk, the sources of which are within a short distance from the tn. In the summer the watering-place is the resort of many holiday-makers, chiefly from London. Hence the tn has been called London by the Sea, but the long vista of sea-front backed by palatial buildings, when lit up by myriads of lights, presents a spectacle which London cannot equal. King's Road is one of the finest thoroughfares in Great Britain, and the Aquarium, a great attraction, was reconstructed in 1927. The W. Pier is 1100 ft long and has a landing-stage of 720 ft; the Palace Pier is 1710 ft in length. The bor. was extended in 1927. During the 10 years before the outbreak of war in 1939, a number of major development plans were successfully carried out, notably the protective works for the undercliff walk and foreshore from Black Rock to Saltdean, the construction of the Black Rock bathing pool and the Madeira Drive, a promenade from the Palace Pier to the Black Rock. Further promenade works were held up by the war, but plans have since been revived. Within the tn

itself a covered market has been built, and recent building construction has included community centres, clinics, and branch libraries. During the war enemy air attack resulted in the demolition of 200 houses, while 900 were seriously damaged. In all there were over 50 air-raids, and the casualty list numbered nearly 1000. The bor. sends 2 members to Parliament. The municipal bor. has a mayor, 19 aldermen, and 56 councillors. Pop. 156,900. See A. Dale, *Fashionable Brighton, 1820-1860*, 1948.

Brighton, tn in Bourke co., Victoria, Australia, situated 8 m. S. of Melbourne by rail. Its fine situation on Port Phillip Bay has made it a fashionable watering-place. Pop. 21,000.

Bright's Disease, see NEPHRITIS.

Brigit, St., of Kildare (other forms, **Brigid** and **Bridget**) (c. 450-c. 525), known as Bride of Kildare, was, according to legends, the daughter of a prince of Ulster. She lived a life of seclusion in the woods, and hence the name Kildare—Kil-dara, church of the oak, where she founded a nunnery, the first to be estab. in Ireland. She is said to have performed many miracles, and is one of the 3 patrons of Ireland with Sts Patrick and Columba. Known in England as St Bride, her feast is on 1 Feb.

Brignoles, Fr. tn in the dept of Var, once the summer residence of the Counts of Provence (q.v.). It has an anct church, containing a 2nd-cent. Christian sarcophagus. Brandy is manuf. Pop. 5900.

Brihuega, see ALCARRIA, LA.

Bril, Matthew (1550-84), Flem. landscape-painter, b. Antwerp. He studied art in Italy during the pontificate of Gregory XIII, by whom he was appointed to paint sev. frescoes in the Vatican. He showed talent, but *d.* when comparatively young.

Bril, Paul (1554-1626), Flem. painter. He was a native of Antwerp, and was led to live in Rome by the success attained by his brother Matthew (q.v.) whom he excelled. On his brother's death, Paul completed his commissions. 'The Martyrdom of St Clement,' in the Sala Clementina of the Vatican, is one of his masterpieces; and he was noted for his landscapes.

Brill, vil. in Bucks, England, 10 m. W. of Aylesbury, with an old post windmill. Pop. 900.

Brill (*Scophthalmus larvis*), flat-fish of the same genus as the turbot, *S. maximus*, but it is smaller, smoother, and more shining in appearance. It belongs to the acanthopterygious family Pleuronectidae.

Brillat-Savarin, Anthelme (1755-1826), Fr. gastron. b. at Belley. In 1793 he became mayor of Belley. To escape proscription he fled from France to Switzerland, and subsequently to America, where he played in the orchestra of a New York theatre. He returned to France on the fall of Robespierre and wrote his posthumously pub. famous *Physiologie du Gout*, a witty compendium of the art of dining. Many eds. and trans. of the work have been pub.

Brilliant, Grigori Yakovlevich, see SOKOL'NIKOV.

Brilliant, diamond (q.v.) cut to resemble 2 truncated cones placed base to base; the sides are covered with facets.

Brilon, Ger. tn in the *Land* of N.-Rhine-Westphalia (q.v.), near the Möhne (q.v.), 76 m. E. by N. of Düsseldorf (q.v.). In the Middle Ages it was an important tn of the Hanseatic League (q.v.), and it has a 13th-14th-cent. church. Pop. 11,000.

Brimstone, see SULPHUR.

Brin, Benedetto (1833-98), It. naval administrator, worked at first as a naval engineer. In 1873 he became under-secretary of state. B. was the right man to carry out the designs of Adm. Saint-Bon, the minister of marine. When in 1876 Depretis appointed him minister of marine, he supervised the construction of the great warships *Italia* and *Andalo*. He was for 11 years in the gov., 1876-98—1876-8 with Depretis; 1884-91 with Depretis and Crispi; 1896-8 with Rudini—and during that time he was responsible for the estab. of shipyards and factories for the production of guns, steel plates, etc. As minister for foreign affairs, 1892, he accompanied the king to Potsdam. He may be regarded as the founder of the It. Navy.

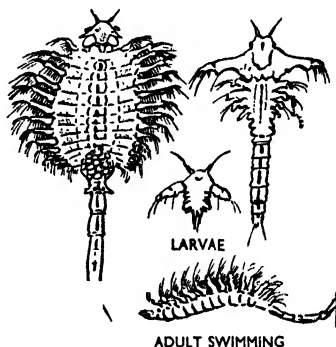
Brindaban, tn in Uttar Pradesh, India, famous as the place where the god Krishna stole the clothes of the milkmaids. A large red temple dating from 1590, one of the most interesting and elegant in India, is sacred to him.

Brindisi: 1. Prov. of Italy, in E. Apulia (q.v.). It is the N. part of the 'heel' of Italy, has a long coast-line on the Adriatic, and is mainly plainland. There is a plateau in the NW. The prin. tns include B. (see below), Ostuni, and Francavilla-Fontana (qq.v.). Area 725 sq. m.; pop. 326,000.

2. (anc. **Brundisium**), It. seaport, cap. of the prov. of B., on the Adriatic, 65 m. SE. of Bari (q.v.). It is situated on a small cape, and has an inner and outer harbour, the outer harbour being enclosed by a mole and sev. small is. It was taken by the Romans from the Sallentini in 267 BC, and developed into the prin. naval station on the Adriatic. It became the chief point of embarkation for Greece and Asia, and had a pop. of 100,000. A journey to B. is the subject of one of Horace's satires (Sat. I. v.), and here Virgil (q.v.) d. on his return from Greece in 19 BC. In the Middle Ages the port was used by the Crusaders (see CRUSADES) but thereafter it decayed. Its prosperity was restored by the opening of the Suez Canal (q.v.) in 1869, and it is now an important port for the E. In Sept. 1943, after the fall of Mussolini and the allied landings in Italy, Marshal Badoglio (q.v.) set up a pro-allied gov. here. B. has a 12th-18th-cent. archiepiscopal cathedral, sev. interesting medieval churches, an old castle, and 2 marble columns said to mark the end of the Appian Way (q.v.). There is a large trade in wine, spirits, oil, and fruit. Pop. (com.) 58,900.

Brindley, James (1716-72), engineer. He was b. at Thornsett, Derbyshire, and he received a very scanty education. His apprenticeship to a wheelwright seems to

have nourished his mechanical genius, for he speedily set up in business for himself and became famous for the ingenuity he displayed. He assisted the Duke of Bridgewater in carrying out his famous canals, and the success of the Manchester Ship Canal must be attributed first to the indomitable genius of B. He d. at Turnhurst, Staffs.



BRINE-SHRIMP

Brine-shrimp, or *Artemia*, is the generic name of some crustacea belonging to the group Anostraca of the Branchiopoda. They inhabit salt lakes, and some interesting experiments have shown that there is a correlation between the salinity of the lakes and the form of the B. These different forms had been described as separate species. See W. J. Bateson, *Materials for the Study of Variation*, 1894.

Brink, Bernhard Egidius Konrad ten (1841-92), Dutch philologist, b. Amsterdam. He studied at Münster and at Bonn. In the year 1870 he was appointed prof. of modern languages and literature at Marburg, and in 1873 he held the same position at Strasburg. He contributed much valuable information on Eng. philology. Chief works: *Chaucer-Studien*, 1870, and *Geschichte der englischen Literatur*, 1874.

Brink, Jan ten (1834-1901), Dutch author and literary historian, b. Appingedam. He commenced a course of theology, but found that his talents were literary rather than theological. In 1884 he became prof. of literature at Leyden, and there wrote sev. works of criticism and of romance. His style is very lucid and elegant, and his criticisms are acute and penetrating. Among his best works are a novel entitled *Het verloren Kind*, 1879, *Causerien over Modernen Romans*, 1885, *De roman in brieven*, 1889, and *Geschiedenis der Nederl. Letterkunde*, 1899.

Brinwilliers, Marie Madeleine, Marquise de (c. 1630-76), Fr. criminal. She married the Marquis de B. in 1651. She learned the secrets of poisoning from her lover, Jean Baptiste de Gaudin, Seigneur de

Sainte-Croix. B. poisoned her father, 2 brothers, and a sister, but failed in her attempt to poison her husband. Sainte-Croix d. by (probably) accidental poisoning in 1672, and the investigations as to the cause of his death revealed B.'s crimes. She fled, but was arrested near Liège, and executed in Paris, July 1676.

Brioude, Fr. tn, cap. of an arron., in the dept of Haute-Loire, on the Allier. It has a 12th-cent. church, and has a livestock market. Pop. 5600.

Briovera, see ST LO.

Brique (Fr. 'small brick'), name given to a kind of fuel, made up chiefly of waste coal-dust. It smoulders for many hrs without going out, and gives a fair amount of heat. It is also used in various industries. The dust is cleansed and dried and then mixed with pitch in a disintegrator, until the 2 ingredients have thoroughly blended. The mixture is then placed in a vertical 'pug-mill'; steam is introduced till the pitch is viscid, and then the mixture is left to cool in moulds. Manufacturing processes vary with the fuel from which the B. is to be made. Lignites and brown coal will briquette without any admixture, as will some bituminous coals; but most bituminous coals, all anthracites, and coke breeze must be mixed with a binding medium to give coherence and hardness to the B. Various other substances, such as tar, asphalt, starch, peat, etc., may be used in the manuf. of B.s. The weight of the B. may be anything from about 8 lb. to a few oz. each, depending on requirements. The value of the briquetting process lies in its ability to convert fuel which otherwise would have little if any value into a marketable product.

Brisbane, Sir Charles (c. 1769-1829), distinguished Brit. admiral who entered the navy in 1779, being a midshipman at battle of the Saints off Dominica, 1782. B. served under Rodney, Hood, and Nelson. In 1796 he was posted after being present at Brindport's action off Genoa and was made captain for his capture of Dutch ships in Saldanha Bay. He helped to cut out the *Chevette* from Camarat Bay, 1801. He commanded the *Arethusa*, and with the *Anson* destroyed the Sp. *Pompona* and 10 gunboats off Havana, 1806. His finest exploit was the capture of Curaçao and sev. Dutch vessels, 1807. Knighted for this by George III; K.C.B., 1815; vice-admiral, 1820; governor of St Vincent, 1808-29. See Ralfe's *Naval Biography*, iv, and *Gentleman's Magazine*, 1830.

Brisbane, Sir James (1774-1826), Brit. naval officer, brother of Sir Charles B. Midshipman in *Queen Charlotte* at Howe's 'Glorious First of June' victory, 1794. As lieutenant served at the reduction of the Cape of Good Hope. In 1801 B. was present at the bombardment of Copenhagen, and was posted. In 1808 he commanded the squadron blockading Corfu, capturing the Fr. *Var*, 1809. Helped to reduce Ionian Is. and establish the sept-insular rep. In 1816 he served at bombardment of Algiers. As commander-in-chief in the E. Indies he concluded the

first Burmese war, 1825. See Marshall's *Royal Naval Biography*, iii.; James's *Naval History*, vi, 1860; Nelson *Dispatches*, iv.

Brisbane, General Sir Thomas Makedougall (1773-1860), soldier and astronomer, b. Largs, Ayrshire. He served in Flanders, the W. Indies, Spain, and N. America, and in 1821 became governor of New S. Wales. The reforms he advocated in penal treatment and the encouragement he gave to immigration were severely criticised; but he promoted the cultivation of land. While in Australia he catalogued 7385 stars, and founded an observatory at Brisbane, which is now called after him. For his work, *The Brisbane Catalogue of Stars*, the Royal Society awarded him the Copley Medal. He also estab. observatories at Larvik and at Makerstown in Scotland. He succeeded Scott as president of the Royal Society of Edinburgh in 1833, and was president of the Brit. Association.

Brisbane, chief seaport, cap., and commercial centre of Queensland, Australia, situated on the Brisbane R., about 25 m. above Moreton Bay. It was first settled as a penal station in 1824 by Sir Thomas Brisbane (q.v.), governor of New S. Wales. The convict station was broken up in 1839; in 1842 B. was opened for colonists; and in 1859 it was incorporated. The tn has 4 divs.: North B., South B., Kangaroo Point, Fortitude Valley. It is the seat of an Anglican bishop and a Rom. Catholic archbishop. There are many fine public buildings, including the Houses of Legislature, the tn hall, the 2 cathedrals, the Queensland Club, a museum, a technical college, and a school of arts. It is the seat of Queensland Univ., which was estab. in 1911. In 1893 the channel of the riv. was dredged and deepened, so that ocean-going steamers can come up the riv. and berth at the wharves. The riv. is navigable by large vessels to the city, over 10 m. from Moreton Bay. There is regular communication by steamship with other Australian ports, B. being one of the chief centres of trade. The prin. exports are wool, tallow, hides, sugar, coal, and frozen meat. The climate is healthy and dry; the mean temp. is 70° F. in the shade. The tn has suffered from the flooding of the riv., notably in 1893, when much of South B. was destroyed. The Bridge which spanned the R. B. was then destroyed, and the Victoria Bridge was built to replace it in 1897. Three bridges, 2 of steel and another a rainbow-arched concrete structure, provide links for traffic between the N. and S. sides of the city which are separated by the B. R. A standard gauge railway line connects with the S. states, and from B. starts the Great N. railway which carries passengers to Cairns 1000 m. away. There are 2 large airports. B. has 4 national and 4 commercial broadcasting stations, an observatory, and botanic gardens. There is a notable race-course at Eagle Farm.

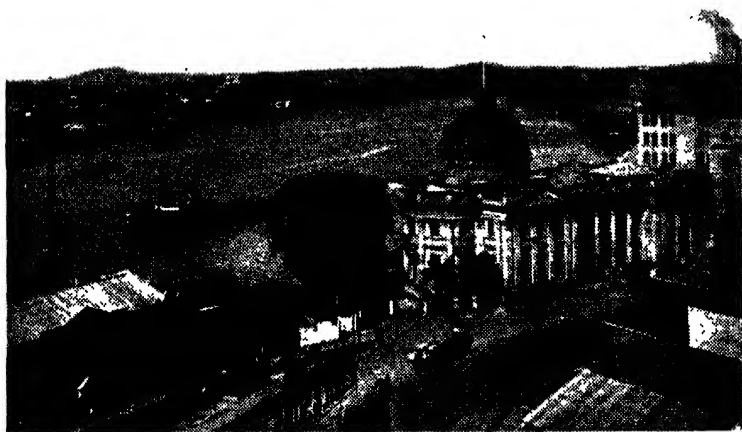
The city of Greater B. was created in 1925, absorbing within its boundaries 19 councils, with an area of 375 sq. m.,

which had been administered by 200 members. Its boundaries radiate approximately 10 m. from the centre of the city. It was the first greater city council area created in Australia. A modern feature, unique in Australia, was the adoption recently of the zoning plan of the city under which provision is made for shopping, residential, manufacturing, and industrial areas, and the creation of a green belt surrounding the city to ensure adequate park lands and recreational facilities for all time. The council

initiated the feud which is the central theme of the *Iliad*.

Brisighella, It. tn, in Emilia-Romagna (q.v.), 25 m. SW. of Ravenna (q.v.). It is built on the slope of a castle-crowned hill, overlooking the Lamone. Pop. 4500.

Brisson, Barnabé (1531-91), Fr. lawyer. In 1575 he became advocate under Henri III, and later was sent as an ambas. to England. After the death of Henri III in 1589 he became the leader of the people, being nominated first president by the Catholic Leaguers. Later he vacillated



BRISBANE

Queensland Government

The Customs-house and Circular Quay.

consists of 25 members, including a lord mayor, all elected on the adult franchise basis, to hold office for 3 years. Civic affairs are unified under one administration. The system is unique in Australia, for in addition to carrying out the ordinary functions of local gov., since 1925 it has had under its charge tramways, electricity, water supply and sewerage, cemeteries, and ferries. An outstanding constructional work completed during the Second World War was the building of a big dock in the lower reaches of the B. R., where all ships and war vessels, excepting those of the very largest type, may receive attention. The Greater B. area (385 sq. m.) is controlled by a city council under a lord mayor. Pop (1955) 515,000.

Briseis, daughter of Briseus, a native of Lyrnessus, on the fall of which place she became the captive of Achilles. Agamemnon took her from him and thus

between the royalists and the people, and was arrested, in spite of a warning to flee, by order of 'The Sixteen,' and put to death at once. Among his chief writings are *De formulis et solemnibus Populi Romani verbis*, 1583, and *Le Code du roy Henri III*. See P. Le Bas, *Dictionnaire Encyclopédique*, 1843.

Brisson, Eugène Henri (1835-1912), Fr. politician, was called to the Bar in 1859. He was vice-president of the Assembly in 1879, and president in 1881. He was Prime Minister 4 years later; but it was during his presidency of the Chamber, 1895-8, and his ministry, 1898, that he distinguished himself by his judicious administration at the time of the Dreyfus trial. He was again president of the Chamber of Deputies from 1905 until his death.

Brisson, Mathurin Jacques (1723-1806), zoologist and natural philosopher, b. Fontenay-le-Comte. He studied for the

Church but did not take orders, preferring to pursue natural science. Became assistant to Réaumur and in 1756 pub. the first vol. of his work on the animal kingdom; but after Réaumur's death in 1757 he abandoned natural hist. for physical science. He was appointed a prof. at the Collège de Navarre and at the Ecoles Centrales in Paris. Some of his best-known works are those on ornithology—among them his *Ornithologie* (6 vols.), 1760; *Pesanteur spécifique des corps*, 1787; *Dictionnaire Raisonné de Physique* (2nd ed.), 1800.

Brissot (de Warville), Jean Pierre (1754-93). Fr. Girondist. He was a native of Chartres, and was trained to be a lawyer. The influence of Rousseau is obvious in his *Théorie des lois criminelles*, 1781, and *Bibliothèque philosophique du législateur*, 1782. After an unsuccessful attempt to found a newspaper, he was sent to the Bastille on a charge of sedition. On his release he renewed his revolutionary activities, and was forced to seek asylum in London. He returned to France in 1789. The keys of the Bastille were given to him on the destruction of the prison, and he was elected a member of the legislative assembly and later of the National Convention. Subsequently his moderate views led to his being accused of royalism. With other leading Girondists he was arrested and guillotined on 31 Oct. 1793. See *Mémoires de Brissot*, Paris, 1830.

Bristle Tails, see THYNANURA.

Bristles, strong, stiff hairs growing on the back of the hog and the wild boar. They are used in the manuf. of brushes, and by shoemakers and saddlers. The quality of the B. depends on length, stiffness, colour, and straightness. The longest and strongest are yielded in relatively small proportion, and are of high value; these are not made into brushes, but are bought by shoemakers. As to colour, the white B. are more valuable than the black and grey ones. Great Britain normally imports vast quantities of hogs' B. from Russia, Germany, France, Belgium, and China, with smaller supplies from Denmark, Holland, the U.S.A., and the E. Indies. The hog of cold countries yields the best B.; those coming from Russia (with Siberia) are the most valued, but France produces excellent white ones. The long thin animal of the N. becomes fat in the S., and its B. deteriorate, becoming softer, shorter, and less straight. The hog sheds its B. by rubbing itself against trees.

Bristol: 1. Cathedral city, municipal, co., and parl. bor., an anct seaport, and a modern industrial and distributive centre of W. England. The co. of B. lies on the borders of Glos and Somerset (B. was created a co. of itself by royal charter of Edward III in 1373). It stands on the Avon, 7 m. from the B. Channel and 118 m. from London. The tn originally occupied a position wholly on the N. of the Avon. The alteration of the course of the Frome by digging, in 1248, a fresh channel, and the erection of a bridge spanning the riv., added to the area of the tn, linking it also

with Redcliffe, owned by the Berkeley family. Later, in 1373, all the dists. were joined, though not without violent opposition from the lords of Berkeley. Founded upon a few ac. of land forming a mound at the confluence of 2 rivs., the tn was favourably sited, both for defence and trade communications, and at one time it was one of the first seaports in Christendom and its old streets were filled with foreign seamen. The atmosphere of the tn in the old seafaring days was brilliantly reflected by R. L. Stevenson in *Treasure Island*, and the 'Llandoger Trow' is the inn which Long John Silver was supposed to have frequented. Clifton (q.v.) is a suburb of B.

It was a discovery of coins minted at Brigstowe, i.e. place of the Bridge, B.'s early name, which proved that there was a community of some importance as early as the reign of Ethelred Unræd (978-1016). At that time the wealth of the tn was derived chiefly from the export of slaves to Ireland. B. was besieged during the wars of Stephen. Henry II gave the tn its first charter in 1171, and also conceded the tn of Dublin to B. residents. A siege occurred during the reign of Edward II, who was unable to reduce the tn to obedience for 4 years. It was recognised as a 'staple' tn in 1353, and enjoyed a considerable trade in wool, leather, wine, and salt. In discovery, colonisation, and maritime enterprise B. played a large part. In 1497 John Cabot sailed from B. in the small ship *Matthew* on the voyage which led to the discovery of the N. shores of the Amer. continent. His son, Sebastian, proclaimed the city his native tn. A considerable trade with the Amer. colonies was estab., and it was men of B. who colonised Newfoundland; for, though Humphrey Gilbert proclaimed Newfoundland to be part of Queen Elizabeth's dominions, no settlement took place until 1610, when John Guy, a B. merchant, obtained a royal charter and planted the first settlement on the Avalon Peninsula. B. also developed strong interest in the colonisation of America, and many communities named after the mother city are evidence of these links. In St Mary Redcliffe Church are to be seen the memorial and armour of Adm. Penn, father of Wm Penn, founder of Pennsylvania. Sev. streets bear names marking the associations of the Penn family with the tn. In Queen Square is the first Amer. consulate to be estab. in England. The first Catholic bishop of America was consecrated by a bishop of Clifton. In the heyday of the W. Indian sugar trade B. vied with Liverpool in the importation of sugar and the traffic in African slaves. In 1643 the city was captured by Prince Rupert, and later, in 1645, by Fairfax. A name honoured by a day being set apart for his celebration is that of Colston, a philanthropist. Sev. famous names are associated with B.: Grocyn, Wraxall, Sir T. Lawrence, and Beddoes, while Southey and Coleridge spent many of their youthful days in the city. In 1774 Burke was returned for the representation of B. in Parliament, though

he declined the honour in 1780. In the 17th and 18th cents. shipware and porcelain were produced at B. (see BRISTOL WARES). The famous *Great Western*, the first steamer intended for transatlantic trade, was built at B. in 1838.

The city contains a splendid array of architectural beauties of considerable antiquity. The cathedral, originally a Norman abbey church, still shows its Norman chapter-house and fine gateway. Other notable churches are St Mary Redcliffe, a 13th-cent. foundation of striking beauty, which was described by Queen Elizabeth (Tudor) as the fairest church in all the kingdom, St Philip's, and St Stephen's. The Rom. Catholic Church has a pro-cathedral and 13 other churches. The estab. Church of England has, besides the cathedral, 88 par. churches. The centres of education are the univ., Clifton College, Queen Elizabeth's Hospital, Red Maid's School, the grammar school (endowed 1532), and Colston's Schools. The univ. (see BRISTOL UNIVERSITY OF) was chartered in 1099. King George V opened its new buildings on 9 June 1925. Architecturally the univ. is handsome and dignified, and is especially noted for its magnificent neo-Gothic tower, which is a prominent landmark. There are faculties of medicine, arts, science, engineering, and law. A chair of aeronautics is a later addition. There is also an agric. research station. Clifton College (q.v.) is a public school. The art gallery (1905) has a collection of interesting modern paintings. The adjoining museum was destroyed in an incendiary raid, but many of its salvaged contents are housed temporarily in the art gallery. The central library was opened in 1906 and there are many branch libraries, some of most modern design. B. Zoo is famous throughout the W. country.

Cents. of trade with Europe, and later with America, gave rise to a thriving balanced industry in the B. area, and the ease with which raw materials could be obtained led to the estab. of more than 300 separate types of industry. Chief among the many industries is engineering. Shipbuilding, motor-car, and aircraft building also absorb large numbers of employees. Nearly 10,000 persons are employed in the tobacco-making industry, and as many are engaged in printing. Other notable industries are clothing, cocoa and chocolate, chemicals, footwear, pottery, tanning, and wood working. B. is the home of the B. Aeroplane Co., builders of the Brabazon, Wayfarer, Blenheim, and other aircraft; of Wills, a branch of the Imperial Tobacco Co., and of Fry & Sons, cocoa and chocolate manufacturers. The distributive trades engage over 18,000 workers. Two aerodromes, the world's largest covered goods depot, good road and canal systems still further facilitate relations with all parts of the U.K. The municipal airport was opened in 1930.

B. is the largest municipally owned port in the country. The dock undertaking is administered by a committee of the corporation under the title of Port of

B. Authority. The corporation is also the conservancy authority and the pilotage authority. The docks, consisting of a total land and water area of 1241 ac. and a total length of quays of 39,390 ft, comprise the Royal Edward and Avonmouth docks, situated on the Glos side of the Avon estuary, the Portishead dock on the Somerset side of the estuary, and the city docks about 7 m. up the R. Avon in the heart of B. B.'s leading position as a port is due to its excellent geographical position at the head of the B. Channel, which provides an outlet of about 100 m. from the open sea. The pop. within the area which can be



Will F. Taylor

UNIVERSITY TOWER, BRISTOL

economically served by the port is over 12,000,000, including the industrial midlands. The port has trading connections with all parts of the world and also a very extensive coastwise trade. The prin. trades of the port are as follows: *Imports*: grain, bananas and other fruit, refrigerated produce, petroleum, tobacco, cocoa, zinc, acid and fertilisers, timber, flour and grist milling, oil seeds, molasses, wine, canned goods, heavy chemicals, paper and woodpulp. *Exports*: chemicals, metals (tinplates, iron and steel), ores, clay, salt-cake, and all kinds of manuf. goods. A quarter of all the U.K.'s tobacco imports passes through B., a million tons of petroleum by-products are received annually, and, during the war years, B. was the world's largest petroleum importing centre; and as one of the prin. banana-importing centres of England B. normally receives 6,000,000 bunches annually.

In the Second World War B. suffered severely in air-raids. Some 1299 persons

were killed and over 3300 injured. Over 3000 houses were totally destroyed. Among the best-known buildings lost were St Peter's Hospital (a medieval treasure), the 17th-cent. Dutch house, the Merchant Venturers' Hall, the Masonic Hall, St Peter's Church (a Norman structure), Temple Church, famous for its leaning tower, and St Augustine's, dating from 1430. In addition almshouses, schools, cinemas, hospitals, factories, many churches, and almost the entire shopping centre, were either destroyed or seriously damaged. The city council has in hand a rebuilding scheme which will give B. a new shopping centre, civic and educational centres, ring roads, trunk roads, and other improvements in communications. Six members of Parliament represent the city at Westminster. The responsibilities for local gov. rest upon the lord mayor, whose office originated in 1216, and a corporation of 28 aldermen and 84 councillors, representing 28 wards. Pop. (estimated) 442,300.

2. Co. in the E. of Rhode Is., U.S.A.: area 25 sq. m. Its cap. and port of entry has the same name, and is situated on Narragansett Bay and New York, New Haven, and Hartford railroad. Its pop. is 29,080. There is a fine harbour where shipbuilding is carried on. There are manufs. of rubber, cotton, and woollen goods. It is believed that this part was visited by Norsemen in the year 1000, and to be referred to in certain Icelandic sagas (see ERICSSON, LEIF).

3. Bor. in Bucks co., Pennsylvania, U.S.A., on the Delaware R., 20 m. NNE. of Philadelphia. It has carpet, hosiery, worsted, metal products, chemical, and wallpaper factories. The first settlement was in 1681; incorporated 1720. Pop. 12,700.

4. Tn of Hartford co., Connecticut, U.S.A., situated 14 m. SW. of Hartford, on the New York, New Haven, and Hartford railroad. It has manufs. of clocks, brass goods, engines, electrical and sports equipment, ball-bearings, textiles, cutlery, bicycle brakes, paints, and concrete products. Pop. 35,961.

5. Tn, partly in Sullivan co., Tennessee, and partly in Washington co., Virginia, U.S.A., the boundary between the 2 states intersecting the tn. It lies 130 m. ENE. of Knoxville. Among its institutions are the King College for men (1868), and Sullins College and Virginia Intermont College for women. The prin. products are furniture, paper, structural steel, mining equipment, knitted goods, butter, and cheese. Pop. in Tennessee, 16,771; in Virginia, 15,954.

Bristol, University of, founded 1909, formerly Univ. College, B. (estab. 1876). The univ. has benefited by the generosity of the Wills family; it comprises the faculties of arts, science, medicine (including dentistry and veterinary science), engineering, and law, with a number of associated theological and training colleges and an agric. and horticult. research station. There are nearly 3000 students.

Bristol Bay, arm of the Bering Sea, lying to the N. of the peninsula of Alaska.

Communication with the interior is opened up for a considerable distance as 2 large lakes empty themselves into this bay. It is in lat. 57° 30' N., and long. 160° W.

Bristol Channel, inlet of the Atlantic Ocean, situated in the SW. of England. It has S. Wales to the N., and Devon and Somerset on the S. It forms an extension of the estuary of the Severn. Its length is about 80 m., while its breadth varies from 5 to 43 m., and its depth between 5 and 40 fathoms. It is Britain's largest inlet. Its coast-line is 220 m. The R.s. Towy, Taff, Usk, Wye, Severn, Avon, Axe, Ely, Parret, Taw, and Torridge flow into it. A feature of the channel is its extraordinary tides, which sometimes rise to a height of 35 ft at King Road at the mouth of the Avon, and even to 50 ft or more at Chepstow. This violent rise causes the Severn hore, a rush of the tide in the form of a wall of water.

Bristol Wares. B. produced earthenware from medieval times, slipware (q.v.) in the 17th cent., delfware (q.v.) in the 17th and 18th cents., and soft-paste porcelain (q.v.) at Benjamin Lund's factory from 1750 to 1751 when it was transferred to Worcester (q.v.). The manuf. of hard-paste porcelain (q.v.) was brought from Plymouth by Wm Cookworthy in 1770. This factory, bought by Richard Champion in 1775, lasted until 1781, when Champion sold out to a Staffs firm at New Hall, whither the factory stock was transferred.

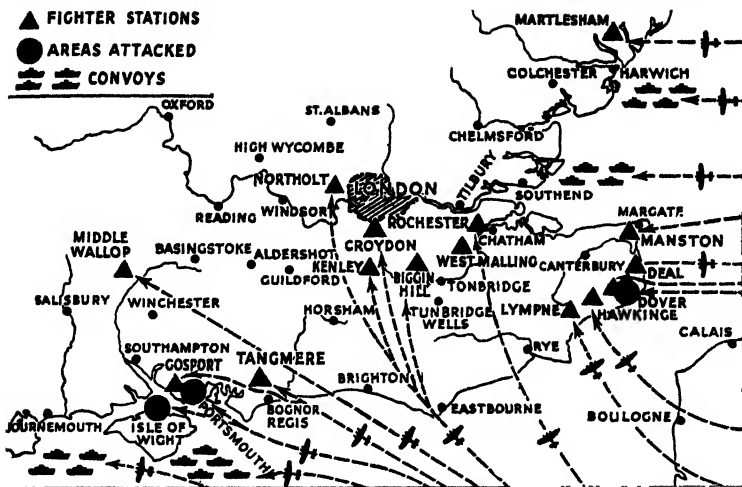
Britain, Ancient. For more than two hundred years antiquaries have recorded discoveries relating to the inhab. of early Britain. Within the last twenty-five years there have been spectacular advances in the method of systematic archaeology, particularly in the technique of scientific excavation and in the development of highly specialised synthetical studies, and a very great deal is now known of the early civilisations of these is. It is not possible to cover the subject adequately in one article. Some indication of the scope and volume of material now available for study and reference is given by the titles of the authoritative works listed below, and by the cross-references to other articles in the *Encyclopaedia*. Very many stone implements (see FLINT IMPLEMENTS) of Palaeolithic (Old Stone Age) hunters have been found in Britain (see STONE AGE), and sev. well-attested sets of their bones; but apart from the caves in which men lived from time to time, there are no visible monuments of this far-off period when the configuration of Britain was very different from that known at present. It was not until somewhere about the 6th millennium BC that Britain became isolated from the continental land-mass of Europe. The New Stone Age, the Neolithic (see STONE AGE), saw the estab. of a farming economy (see WINDMILL HILL) of an ultimate Mediterranean origin; immigrants from the Low Countries and Scandinavia invigorated this society, whose earthwork (q.v.), cattle compounds, and megalithic tombs (see MEGALITH CULTURE) are among the leading field monuments of

prehistoric Britain (see BARROWS). Somewhere about 1800 BC, pastoralist immigrants from France and the Low Countries, powerful and with an estab. aristocracy, introduced and advanced the benefits of metal-working (see BEAKER FOLK). To them are due the erection of religious sanctuaries (see HENG MONUMENTS and STONE CIRCLES) such as Stonehenge (q.v.) in part, and Avebury (q.v.), but there is also in the vast number of weapons and in the earthwork forts (see HILL FORTS) much indirect evidence of tribal warfare (see BRONZE AGE). By 500 BC waves of Celtic invaders, warriors and farmers who were already in touch with the high civilisations of the Mediterranean, began to reach various parts of Britain (see IRON AGE). The subsequent developments of the Early Iron Age civilisations and their relative cultures with notable artistic achievements, a stable agriculture, and important civic centres, provides one of the most rewarding studies in Brit. prehist. With the conquest by the Emperor Claudius in AD 43, the written hist. of Britain may be said to have begun. See BRITAIN, ROMAN HISTORY OF.

See J. G. D. Clark, *Mesolithic Age in Britain*, 1932, and *Prehistoric England*, 1940; V. G. Child, *Prehistory of Scotland*, 1935, and *Prehistoric Communities of the British Isles*, 1949 ed.; R. H. Hodgkin, *History of the Anglo-Saxons*, 1939 ed.; F. M. Stenton, *Anglo-Saxon England*, 1943; Cyril Fox, *The Personality of Britain*, 1944 ed.; J. Hawkes, *Early Britain*, 1945, *A Land*, 1951, and *A Guide to the Prehistoric and Roman Monuments in England and Wales*, 1951; J. and C. Hawkes, *Prehistoric Britain*, 1947; Stuart Piggott, *British Prehistory*, 1949, and *Neolithic Cultures of the British Isles*, 1950; Stuart Piggott and Clyn E. Daniel, *A Picture Book of Ancient British Art*, 1951; J. Raftery, *Prehistoric Ireland*, 1951; H. N. Savory, *The Prehistory of Wales*, 1951 ed.; Dorothy Whitelock, *The Beginnings of English Society* (Pelican History of England), 1952; L. V. Grinsell, *Ancient Burial Mounds of England*, 1953 ed.; also the Ordnance Survey *Period Maps*, and *Maps of Ancient Britain*, 1951; H.M. Stationery Office, *Regional Guides to Ancient Monuments* (illustrated), 1951 ed.; the vols. of the Victoria Co. Hist. (in progress); the inventories of the Royal Commissions on Ane and Historical Monuments for England, Wales, and Scotland (in progress); the Brit. Museum pubs. *Flint Implements*, 1950, and *Later Prehistoric Antiquities*, 1953.

Britain, Battle of. Ger. air-attack on Britain in Aug.-Oct. 1940. During this battle, unique in the hist. of mankind, 1733 Ger. aircraft were destroyed, as against the loss of 375 pilots killed and 358 wounded of the Brit. fighter command; 915 Brit. aircraft were lost, though the Germans claimed to have destroyed 3058. During daylight 1700 persons, nearly all civilians, were killed, and 3360 seriously injured, while, at night, 12,581 were killed and 16,965 injured. The encounters between opposing aircraft often

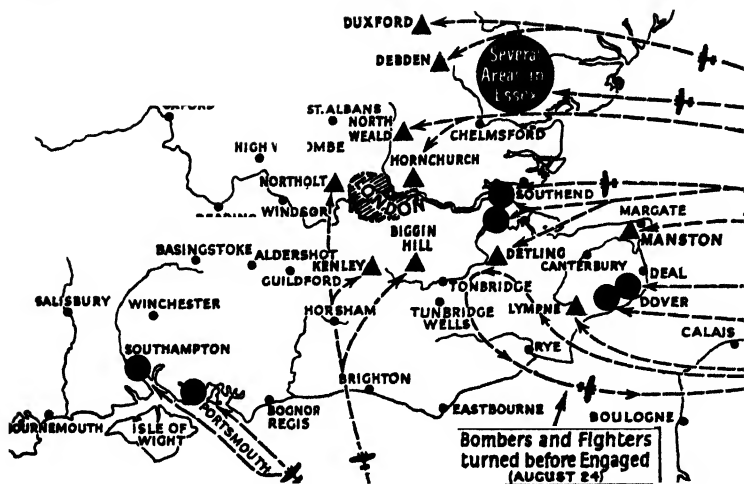
took place more than 3, 4, 5, and sometimes more than 6 m. above the surface of the earth by hundreds of machines flying often over 300 m.p.h. The battle not only brought into clear relief the brilliance and courage of the Brit. airmen, but showed how sound tactics and planning balked the enemy at every turn and prepared the defence for each new move. In this, the greatest air battle of hist., 'the Ger. Air Force was reduced from a confident smooth-running organisation to a shattered armada' (H. St G. Saunders, *The Battle of Britain*, 1941). The enemy's avowed object was to end the war before the close of 1940 and, to achieve this, an invasion of Britain was deemed essential. Before the Ger. Army could land, however, it was necessary to destroy the Brit. coastal convoys, to sink or immobilise intervening units of the R.N. and, above all, to chase the R.A.F. from the skies. Hence a series of air attacks were launched first on Brit. shipping and ports and then on aerodromes. There were 4 phases of the battle, and during the final phase daylight attacks gave way gradually to night raids of increasing intensity. During the first phase (8-18 Aug.) the Germans sent over massed formations of bombers, escorted by similar unwieldy formations of fighters flying up to 10,000 ft above the bombers. Employing these tactics the enemy made 26 attacks, first on shipping and S. ports. Realising that the Brit. fighter force was stronger than he had imagined, the enemy next attacked fighter aerodromes in S. and SE. England, while maintaining the attack on coastal tns. In this first stage the enemy made feint attacks on coastal objectives in the hope of drawing off the Brit. fighters, following these feints soon afterwards with the real attack against ports or aerodromes between Portland and Brighton. Generally these attacks were countered by using half the available squadrons to deal with the Ger. fighters and the rest to attack the bombers. The Brit. fighters' attacks from the stern on the Messerschmitt 109s and 110s were the more effective because these Ger. aircraft were not then armoured. The ratio of loss was about 1 Brit. to 5 Ger. airmen and would have been even more striking had not so much of the fighting taken place over the sea. Then followed a 5-day lull, Goering (q.v.) evidently deciding to change his tactics. In the second stage (19 Aug-5 Sept.) the main Ger. attack was delivered on a wider front, and tactics were changed by increasing the number of escorting fighters and reducing the size of the bomber formations, while the covering fighter screen flew at very great heights. The bomber formations, too, were protected by a 'box' of fighters, which sometimes broke through the forward screen of Brit. fighter forces by sheer weight of numbers, though only at the cost of numerous casualties. Having thus altered his tactical formations, the enemy proceeded to deliver some 35 major attacks between 24 Aug. and 5 Sept., his prime object being to destroy the inland fighter aerodromes and aircraft factories. During



PHASE 1: 8-18 AUG. GOERING'S BID FOR TOTAL VICTORY

these 12 days the Brit. tactical divs. were altered, the effect being to cause the enemy to be met in greater strength and further away from the inland objectives, while such of the Ger. aircraft as eluded this forward defence were dealt with by rear squadrons. The fighting efficiency of the Brit. fighter squadrons was put to considerable strain, but the enemy failed entirely to put them out of action. The third stage of the battle began on 7 Sept. with a mass attack on London, lasting an hour. The waves of attack consisted of formations of 20 to 40 bombers, with an equal number of fighters in close escort, with additional protection by large fighter formations flying at a much greater height. By way of diversion dive-bombers reappeared in attacks on coastal objectives and shipping. By night single aircraft dropped bombs at random over London. Between the coast and London, usually in the Edenbridge-Tunbridge Wells area, the raiders were met by Brit. Spitfires, which attacked the high-flying fighters, while Brit. Hurricanes, which had taken off first, engaged the fighter escorts, and were followed by other squadrons which fought the bombers. The attack on London was the crux of the battle. It continued from 7 Sept until 5 Oct. and was the last desperate attempt to win victory. Goering put forth all his strength, and during this phase 38 major attacks were made by day. On 7 Sept. a force of 350 bombers flew in 2 waves up the Thames estuary, some penetrating as far as Cambridge. On 15 Sept. came the climax: 300 Ger. aircraft, 150 in the morning and a like number in the afternoon, fought a running fight with Hurri-

cans and Spitfires from Hammersmith to Dungeness and from Bow to the Fr. coast. Over 50 wrecked Ger. machines littered S.E. England as the result of this single day's fighting, and so redoubtable were the Brit. fighters that the Ger. pilots could be heard calling out to each other over their wireless telephones: 'Achtung! Schpittfeuer!' In all these major daylight attacks the Ger. fighter escorts steadily increased in numbers, till the ratio was 4 fighters to 1 bomber. Often the enemy jettisoned his bombs before reaching his apparent objective as soon as he saw the Brit. fighters. As the autumn wore on and the sky grew more cloudy, the enemy began to make more use of fighters flying very high above the clouds. But the high fighter screens were engaged by pairs of Spitfire squadrons half way between London and the coast, while wings of Hurricane squadrons attacked the bombers and their escorts before they reached the fighter aerodromes E. and S. of London. Other Brit. squadrons formed a third and inner ring, patrolling above these aerodromes, thus forming a defensive screen to guard the S. approaches to London. The final stage of the battle began on 6 Oct. The enemy's strategy and method now changed completely. He withdrew nearly all his long-range bombers and tried to achieve his end with fighters and fighter bombers—eloquent proof of the hammering his depleted bomber force had received by daylight. He now chose the night and, in increasing numbers, mass fighter formations came at great height in almost continuous waves to attack London, still the prin. target. By 31 Oct. the B. of B. was over. It did not cease



PHASE 2: 19 AUG.-5 SEPT. THE ATTACKS MOVE INLAND

dramatically or suddenly; it simply 'petered out.' Bitter experience had at last taught the enemy the cost of daylight attacks. He took to the cover of night. The enemy had paid dearly for his attempt to conquer Britain. It was a great deliverance. The Brit. airmen had turned the tide of world war by their prowess and by their devotion. 'Never in the field of human conflict was so much owed by so many to so few' (Winston Churchill). But though the Luftwaffe failed to destroy the fighter squadrons of the R.A.F., the situation during the battle was critical in the extreme. Pilots had to be withdrawn from the bomber and coastal commands and from the Fleet Air Arm and flung into the battle after hasty preparation. The majority of the squadrons had been reduced to the status of training units, and were fit only for operations against unescorted bombers. But the indomitable courage of the fighter pilots and the skill of their leaders brought the nation through the crisis, and the morale of the Germans cracked because of the tremendous losses which they sustained.

The course of the war during the autumn of 1940 was largely determined by the all-important fact that Germany failed to overwhelm Britain by the use of air power. Such plans for the invasion of Britain as Hitler may have made had now to be postponed and, unless he could redress the situation in the air, the projected invasion might have to be abandoned for good and all. The attacks on air bases, which had been so decisive a preliminary in the Ger. campaigns in Poland and in the Low Countries, had failed utterly against Britain; not a single

aerodrome had been put out of commission for more than a very short time. The failure of the Luftwaffe to overcome the R.A.F. made it impossible to batter the S. ports into chaos and so secure the complete mastery of the Channel. But, though the daylight raids had virtually disappeared, the B. of B. was in effect continued by night; and, thenceforth, every night hundreds of bombers flew in to pour tons of high explosives, first on London and then on the chief prov. tns. Considerable damage was done at times, but accuracy of aim was impossible, even with the aid of flares. A considerable part of the London dock system, with its surrounding warehouses and factories, was destroyed, and in nearly every quarter of the cap. shops and houses were demolished and old landmarks obliterated, together with the dislocation for a time of vital services such as gas and electricity and water. But the nerve centre continued to function and public morale remained unimpaired, especially as rapid progress was everywhere made in the construction of air-raid shelters and in the organisation of fire-fighting services. But still there remained the threat of grave damage unless some answer to the night bomber could be found. A partial antidote was sought in the rapid multiplication of anti-aircraft guns, whose tremendous box barrage kept the raiders at a great height and threw them off their course. New methods, too, of prediction contributed to the accuracy of the gun fire and new combinations of searchlights and anti-aircraft fire were worked out. Gradually the use of fighter planes against the night bombers was increased by selecting



PHASE 3: 6 SEPT.—5 OCT. THE LUFTWAFFE LAUNCHED AGAINST LONDON
 Diagrams based on illustrations in 'The Battle of Britain,' with permission of the Controller, H.M.S.O.

pecially trained pilots and adapting such planes as the Defiant and Nighthawk to this complex purpose. On the other hand, the Germans were also gaining experience, and their night raids struck ever harder blows with decreasing numbers of bombers, carrying land-mines and torpedoes; and, guided by cross-beam radio, they could at least reach any given town in Britain. After sev. weeks of this groping, indiscriminate bombing, the enemy at length appreciated the ineffectiveness of their new methods. They treated London as one only of a number of objectives and concentrated their assaults on other towns in turn. Coventry was chosen for the night of 14 Nov. Some 500 planes swept in continuous waves throughout the long hours of moonlight and rained over 400 tons of bombs on the heart of the city, dropping loads of high explosives on fires previously started by incendiary bombs. Coventry provided the classic example of indiscriminate bombing, resulting in the destruction of the main shopping centre, disorganizing utility services, and demolishing the famous cathedral, but leaving the essential industrial plants but little the worse. This raid inaugurated a series of similar, but rather less damaging, attacks on Britain's chief prov. cities—Birmingham, Liverpool, Southampton, and Bristol suffered frequent hammering, while London periodically experienced mass revisitations. Later Plymouth, Manchester, and Glasgow (the last-named particularly in Mar. 1941) sustained considerable loss of life and damage to house property. The direct damage to Britain's war production

was less a matter of spectacular destruction than of methodical attrition. None of the essential services broke down. In a total war the disorganisation of civil life was inevitably a part of the Ger. military technique and it is no exaggeration to say that the civilian was in the first line of battle. But far from the morale of the Brit. people being broken, there were revealed resources of fortitude and cheerfulness and generosity of voluntary effort that were the very essence of the living spirit of democracy, and it was in this spirit, almost as much as on her physical resources, that the survival of Britain continued to rest. See also AIR FORCE, ROYAL. See A. Mee, *Nineteen-Forty*, 1941; H. A. St G. Saunders, *The Battle of Britain* (Air Ministry), 1941; N. Macmillan, *The Royal Air Force in the World War* (4 vols.), 1942-50; P. Fleming, *Invasion*, 1940, 1957.

Britain, Great, see GREAT BRITAIN.

Britain, Roman, History of (see also ROMAN REMAINS IN BRITAIN). The fact that Caesar attempted no more than 2 short punitive expeditions against B. did not hinder the infiltration of Rom. ideas and material culture. A cent. of slow and quiet progress, of which both Brit. and Rom. merchants took advantage, ensued until in AD 43 peace was broken by the invasion under the Emperor Claudius.

The invasion was carefully planned and well carried out. The reasons which prompted its execution at this time were sev. There was political unrest among the Celtic tribes of B., some of whom had become nationalistic and anti-Roman

in their outlook and were thus a danger to the prov. of Gaul. The trade of B. in general, and that in minerals and corn in particular, much of it already in the hands of Rom. traders, could be further secured by making the is. part of the Empire. The conquest had for many years been considered advisable in the interest of Rom. overseas policy and Claudius, whose rise to power had been brought about by the army, was being pressed for a military triumph. His opportunity came with the death of the great Cunobelin (q.v.). King of the Catuvellauni. An army consisting of 4 legions and auxiliary troops landed on the coast of Kent, and in a few weeks and with relatively little fighting, the Rom. forces had secured a satisfactory base along the estuary of the Thames which permitted a ready advance into the Midlands and, what was equally important, an adequate supply line to the Continent. Each of the 4 legions engaged, with its auxiliary troops of light armed infantry and cavalry, worked as an independent unit. So rapid was the domination of most of lowland B. that within 4 years the army was well estab. on the frontier of S. Wales and, by about AD 75, the Ninth Legion was occupying its fortress at York (*Eboracum*).

There was little or no resistance in the S. and E., where the native folk, already well used to Rom. ideas, expected and perhaps even welcomed their inclusion within the Empire. An outstanding event was the revolt of the Iceni, a tribe in E. Anglia who, provoked by the demands made on them by the army of occupation, mobilised their forces under Boudicca (familiar to us as the golden-haired Boadicea) widow of their last ruler, and sacked the flourishing Romano-Brit. tns of *Camulodunum* (Colchester, q.v.) and *Verulamium* (q.v.) (St Albans), and even reached the busy undefended trading port of London. The massacre of the Romans and Romanised Britons living in these tns was fierce and terrible; equally so was the devastating revenge taken by the Rom. army on the countryside of the Iceni.

In contrast to the rapid conquest of lowland B., the course of the campaign in the N. and W. was long drawn out. Here, in a countryside rendered difficult of attack by its physical features, and often by its unfriendly climate, lived folk of an ancient stock who differed in almost every way from the inhabs. of the S. and E. The Silures of SE. Wales were subjugated by the governor Sextus Julius Frontinus, a capable soldier who was responsible for the setting up at Caerleon (q.v.) (*Ica*) of the second legionary fortress. Wales was not finally secured until the campaign in 78 by Agricola, a governor upon whose sound strategy and wise administration the future of the prov. was to depend, and who is well known from the biography written by his son-in-law, Tacitus. In the next year, Agricola reduced and then fortified the N. and NW. of England, with a third legionary fortress at Chester (*Deva*) as his base.

An advance into Scotland followed, with the building of a line of forts across the Forth-Clyde isthmus, and the mythical battle of 'Mons Graupius' fought, perhaps, close to the camp at Inchtuthill, Perthshire, where he subdued the massed forces of the Caledonians.

A clear and undeviating frontier, intended to mark for all time the N. limit, not only of Rom. B., but also of the Empire, was the great and impressive wall built by the Emperor Hadrian between Tyne and Solway. Its 70-m. course with fortlets at intervals of a Rom. m. and intermediate signal towers, its accompanying road system and its great S. ditch, contemporary in structure with the wall, form together the best known and the most dramatic monument of the Romans in B. (see HADRIAN'S WALL).

About 143 the frontier was moved N. to the Forth-Clyde line of Agricola, and in the 36 m. were built the 19 forts of the Antonine Wall. As a tactical unit it was simple and well-designed, and it served its purpose as the N. barrier until about 155 when it was badly damaged in the first of a series of inroads and revolts. N. of Hadrian's Wall, the country continued to have a troubled hist., and peace and prosperity arrived only with the expedition of the Emperor Severus who, from a landing at Crinan on the S. of the Firth of Forth, advanced in 208 even N. of Aberdeen. Much new knowledge of the hist. of Rom. Scotland has recently been obtained from an aerial survey undertaken by the Univ. of Cambridge, and from this research it seems likely that our present understanding will need to be greatly modified.

The Caledonians were in arms again by 275, and to add to the Imperial difficulties, at the other end of the prov. Saxon pirates were beginning to raid the long-estab. and peaceful settlements close to the Kent and Sussex coasts; and in turn 2 officers of the Channel Fleet, to which was allotted the task of putting down the Saxon raids, usurped the title of Emperor of B. The emperor himself visited the prov. to restore order, and under Constantine—although the Saxon raiders continued to menace the SE. and the coastline, and the 'Saxon Shore' was expressly fortified against them—there was again a period of general peace and prosperity. But the shadows were fast falling. By 367 the Picts of Scotland were harrying far and wide into the civilised areas of England; Scots from N. Ireland were invading the south-west of Scotland and the W. coast of England; and the incursions of the Germanic pirates became more frequent. It was a great shock to the defence system, and in spite of a capable regrouping of forces by Theodosius, the country never recovered from the severe damage inflicted by the violent barbaric onslaught. When, in 383, a Sp.-born Commander in B., Magnus Maximus, called himself Emperor and transferred part of the Brit. garrison to Gaul with the idea of conquering for himself the whole of the Rom. Empire, the end was near. A partial recovery was made possible by

the general Stilicho's brilliant but hopeless reorganisation of the forces still remaining in B. The defended area of the prov. was greatly reduced, and the forces seem to have been centred on York and on the Saxon Shore. But the recovery was short-lived. Yet another usurper, a common soldier called Constantine, in 407 withdrew the garrison to Gaul to seek his chance of fame and fortune, and with his going, B. was in fact no longer a prov. of the Rom. Empire. It was the end, in the words of one of our leading scholars, not of all that Rome had meant for B., but rather of what B. had meant to Rome. See R. G. Collingwood and J. N. L. Myres, *Roman Britain and the English Settlements*, 1937. The best book, with a useful bibliography, is I. A. Richmond's *Roman Britain* (Pelican Hist. of England), 1955. See also Brit. Museum, *Guide to the Antiquities of Roman Britain*, 1951, and *Ordnance Survey Map of Roman Britain* (3rd ed.), 1956. For the army see Graham Webster, *The Roman Army*, 1956.

Britannia Metal, white alloy of tin and antimony, a usual formula being tin, 90 per cent; antimony, 7.5 per cent; copper, 1.5 per cent; bismuth, 1 per cent; the last addition increasing the fusibility. Initially used as a substitute for pewter, it is now being rapidly displaced by nickel-silver.

British Academy, incorporated by royal charter in 1902, founded in order to promote 'the study of the moral and political sciences, including hist., philosophy, law, politics and economics, archaeology and philology.' It is governed by a president and a council of 15, who are elected annually from the 200 fellows of the Academy. Its *Proceedings* are pub. regularly and it issues monographs and numerous reprints of lectures delivered before its members. The Academy also offers various prizes, such as the Cromer prize for a Gk essay, and the Rose Mary Crawshay prize of £100 for research in Eng. literature, and administers gov. and other funds for research in the humanities.

British and Foreign Anti-Slavery Society first met in 1837. Its original president was Thomas Clarkson. It was founded to end slavery and slave traffic all over the world, and to protect all emancipated in any Brit. dominion. The society joined forces in 1909 with the Aborigines Protection Society, founded in 1839, the name of the new joint society being the Anti-Slavery and Aborigines Protection Society. See CLARKSON, THOMAS.

British and Foreign Bible Society, see BIBLE SOCIETIES.

British Armies in the World Wars. In the First World War over 8,000,000 men passed through the ranks of the Brit. Armies. The total number of troops was 8,654,467, made up as follows: Brit. Is., 5,704,416; Canada, 640,886; Australia, 416,809; New Zealand, 220,099; S. Africa, 136,070; India, 1,401,350; crown colonies (including coloured troops from the W. Indies, etc.), 134,837.

Second World War: U.K. (mid 1945)—army numbered 1,931,000 (besides A.T.S.,

191,000); civil defence, N.F.S., etc., 127,000. Canada—total enlistments, 788,042. Australia—over 1,000,000 persons enlisted (civil defence workers numbered 300,000, and home guard 98,000). New Zealand sent 2 divs. overseas. The total enlistments in the S. African forces were 345,049, most of whom served in N. Africa. The Indian Army at its peak was 2,250,000 strong, a volunteer force and an empire record surpassed only by the U.K. Crown colonies also supplied contingents which served in Libya, Burma, etc. For casualties in the Second World War see CASUALTIES.

British Army. General historical sketch. The A.-S. army was essentially a territorial militia based on the same principle as the great Teutonic armies, i.e. that it was the right of every freeman to bear arms in the defence of his country. Alfred reorganised his army (the *fyrð*) by dividing the levies he raised into 2 sections, to serve alternately; the members of one were on active service while the members of the other pursued their normal domestic occupations at home. The whole system was changed by the Norman Conquest in 1066. By the end of William I's reign the feudal system had practically been accepted by everybody in England. On its military side it divided England roughly into 60,000 knights' fees, the holder of each of which was liable to knight's service for 40 days in the year. The feudal levy was, theoretically at least, bound to serve the king anywhere, but in fact there were many drawbacks to the system. The feudal force was barely sufficient for the crushing of a small revolt, and was ridiculous when applied to a foreign war. Gradually, as a result of the desire of the king to have a dependable B. A. and to crush the barons, the system of scutage (q.v.), instituted by Henry I, grew up. With the money thus obtained the king might raise mercenary troops, and so in future the purpose of the king was not so much to raise soldiers from the feudal fiefs as money to obtain soldiers.

The estab. of a mercenary B. A. was obviously the beginning of the estab. of a standing B. A., but in the meantime there grew up another totally different force. The militia, or, as it was originally called, the *posse comitatus*, was the levy of all able-bodied men in the country who were liable to be called out at any time to keep the king's peace. The militia raised in this way was liable to be called out for military service at home, but not abroad, although it seems to have served from the beginning in very much the same way as the later militia, as a means of recruiting the B. A.

The system by means of which the Edwards raised their armies, and especially that used during the Hundred Years War, was a combination of the feudal and mercenary systems. Edward III and Henry V both depended entirely upon the resources of England for the men whom they placed in the field, and obtained these men by means of contracts with the great nobles and the captains of free companies, incidentally in this way

solving social and economic problems. The captains of each regiment were given contracts, usually for 1 year, by which they were to maintain and arm their soldiers, and in return were to receive a certain fixed sum. The money for the soldiers was supplied from various sources, some coming from the royal revenues, some from parl. grants, some from the feudal fines paid in lieu of service. But all armies were disbanded at the end of a campaign, since the king no longer had the money wherewith to maintain them. During the Tudor period armies were raised in a very similar fashion; under Henry VIII the yeomen of the guard and gentlemen-at-arms prepared the way for the creation of a standing army.

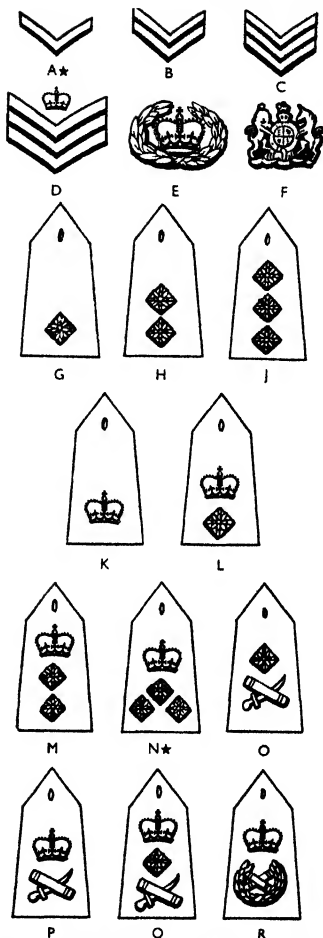
The accession of Charles I marks a new period, or at least the beginning of a new period. The army becomes a source of constant trouble between the king and his parliament. By accepting the Petition of Right Charles practically declared that the king had no right to keep a standing army in time of peace. After the Civil war the army became the most important factor in the politics of the country; the New Model Army may well be regarded as the first Brit. standing army. Cromwell at least realised that it was impossible to fight the Cavaliers, with the whole tradition of command behind them, save with a force that had some equally great object as its motive power. The result of this was the raising first of the 'Ironsides,' later of the New Model Army, a regiment and an army which were founded on the basis of strict discipline and spiritual enthusiasm. At one time Cromwell had a standing army of about 80,000 men, fanatically enthusiastic as to the principles of the Civil war and masters of the country. The Restoration naturally led to the disbandment of this force, which for many years had held down the Cavalier party now in power; but with the accession of Charles II the foundations of the present standard army were laid. Most of the forces were disbanded, but Monk's foot regiment (Coldstream Guards) was kept, and 2 regiments of life guards were formed from amongst the Cavalier supporters of Charles II. In addition, certain towns and fortresses were garrisoned with permanent troops. With the acquisition of ter. in Africa and India we get also the formation of permanent regiments for their garrison and protection. During the reign of Charles II there were formed at home also a few other regiments, among them being the King's Own and the Buffs. James II raised a standing army which at one time consisted of 20,000 men, two-thirds of whom were stationed at Hounslow Heath in order to overawe the Londoners. In spite of the protests of Parliament, to whom he had proposed the raising of a larger standing B. A. in lieu of a militia, he continued to raise men, to use martial law, and to billet his soldiers on private persons. This use of the royal prerogative was one of the many causes of James's overthrow in 1688. Following the accession of William III Parliament

took steps to ensure that the military forces of the country were under its control, and it is from 1689 that the standing army as a legal entity dates. The outbreak of the war of the Sp. Succession saw the raising of a large standing army, an army which reached the dimensions of about 200,000 men, but which was immediately reduced to a peace footing after the declaration of peace at Utrecht in 1713. During the early wars of the 18th cent. the B. A. distinguished itself in many battles: at no time perhaps was it better than during the campaigns of Marlborough. But during the Amer. War of Independence the glory and prestige of Brit. arms waned. The early efforts of the B. A. during the revolutionary wars were not altogether successful, but the new organisation and training under the Duke of York did much to increase its efficiency. Victories can after this be recorded almost everywhere, in Egypt, in India, and in Europe. Between Waterloo and the Crimean War the B. A. did not undergo many changes. Some battles were fought in India and the colonies, but the B. A. rested and supported itself upon the honours which it had won in the Peninsula and at Waterloo. It was a period of stagnation and rest, a rest which was to receive a rude shock in the disasters of the Crimean War. This war opened the eyes of the country to the absolute necessity for B. A. reform. Between the Crimean War and 1871 England received many lessons from the continental nations. France fought in Italy in 1859, but the real lessons came from Prussia, who proved the overwhelming value of a well-trained reserve in the Austro-Prussian war of 1866. The other nations realised that in order to keep on level terms their armies also must be reorganised, that the art of war must be more carefully studied, and these lessons were emphasised by the Franco-Ger. war of 1870-1. From that time the War Office received special attention from successive war ministers.

During the period between 1868 and 1874 when Cardwell was secretary of state for war, the B. A. was completely reorganised. The War Office was placed under unified control, short service was introduced, regular, militia, and volunteer units were linked together, and the purchase of commissions was abolished. Those reforms were consolidated when Childers became secretary of state for war in 1880, and the present system of co. regiments was adopted. During the periods of office of Brodrick (later Earl of Midleton) (1900-3) and Arnold-Forster (1903-5) extensive measures of decentralisation were introduced—among them the present system of local commands. With Arnold-Forster too came the abolition of the office of Commander-in-Chief, and the estab. of the Army Council (1904). Under Haldane (1905-12), the greatest of the secretaries of state, sweeping changes took place in the organisation of the auxiliary forces. The volunteers were replaced by the Territorial Force, and the Militia by the special Reserve. Haldane was also

responsible for the estab. of an efficient general staff, and the planning of an expeditionary force. His work bore fruit in 1914 when the dispatch of a force of 7 divs. to France was accomplished in a matter of weeks. Unfortunately, Kitchener, the secretary of state who took office at the outbreak of war, did not make use of the machinery Haldane had created in the Territorial Force for the reinforcement of the expeditionary force. Kitchener, owing to his long service abroad, was out of touch with military developments in his country, and set about the creation of a new series of armies. The delays in training and dispatch of reinforcements almost led to the destruction of the old regular army. The period between 1914 and 1918 was one of enormous expansion. The B. A.'s strength at the outbreak of war, including reserves, was 798,000; by March 1918 it had reached a peak figure of 3,859,000. Voluntary recruiting had proved insufficient to maintain a force of such a size and in 1916, conscription was resorted to for the first time. Despite the large numbers engaged, the First World War affected the B. A.'s basic organisation to a limited extent only. Of the 2 special arms created, the Tank Corps and the Machine Gun Corps, only the first survived. The Royal Flying Corps, originally formed in 1910, provided the basis of an independent Air Force in 1918. The cavalry army, which proved of limited service only during the war, survived for many years longer.

During 1919 the wartime armies were demobilised, and a new regular B. A. was brought into being. In 1921, the Territorial Force was reconstituted and remained the Territorial Army. In the following year, there were considerable reductions in the size of the regular B. A. Five Irish Infantry regiments were disbanded—the Royal Irish Regiment, the Connaught Rangers, the Dublin, and the Munster Fusiliers, and the Leinster Regiment. The 1st and 2nd Life Guards were joined to form 1 regiment and the regiments of the cavalry of the line reduced from 28 to 20 by amalgamations. Infantry regiments with more than the normal complement of regular battalions had these cut to 2. Few changes in B. A. organisation took place during the next 15 years. The most important development was the conversion of 2 cavalry regiments, the 11th Hussars and the 12th Lancers, into armoured car regiments in 1928. The 2 years before the outbreak of war in Sept. 1939, however, saw considerable changes. The remaining line cavalry regiments were mechanised. The last to be converted were the 1st Royal Dragoons and the Scots Greys. These 21 armoured regiments, together with their yeomanry counterparts, and the Royal Tank Regiment, were brought together in 1939 to form the Royal Armoured Corps. A great expansion of the Territorial Army (T.A.) took place and many T.A. infantry battalions were transferred to other arms. Provision was made at the beginning of 1939 for a regular



BADGES OF RANKS AND APPOINTMENTS
(*) IN THE BRITISH ARMY

A★, lance-corporal; B, corporal; C, sergeant; D, staff-sergeant; E, warrant officer, 2nd class; F, warrant officer, 1st class; G, 2nd Lieutenant; H, lieutenant; J, captain; K, major; L, lieutenant-colonel; M, colonel; N★, brigadier; O, major-general; P, lieutenant-general; Q, general; R, field-marshal.

army of 233,000 and a territorial army of 204,000; to maintain this strength conscription in peace time was introduced for the first time.

The war, when it came in Sept. 1939, brought considerable changes in the relative strength of the various arms. Artillery acquired still greater importance and the Royal Artillery was expanded enormously. The armoured regiments played a far more vital role than had their cavalry predecessors in the First World War, and sev. new regiments were raised. Infantry on the other hand suffered a relative decline. A number of infantry battalions were converted into regiments of the newly formed Reconnaissance Corps. An important new development was the use of airborne troops. This led to the formation of the Army Air Corps, the constituents of which still survive (the Glider Pilot Regiment, the Parachute Regiment, and the Special Air Service Regiment). The special needs of the time led to the formation too of a number of additional corps performing particular services such as the Corps of Royal Electrical and Mechanical Engineers, the Royal Pioneer Corps, the Intelligence Corps, the Army Physical Training Corps, and the Army Catering Corps. Nearly all these wartime creations still survive—exceptions are the Reconnaissance Corps and the Army Air Corps. The demand for troops in the field in the case of the Second World War was nothing like so great as it had been in the First World War—casualties were far fewer and the periods during which major operations were undertaken were much shorter. In consequence the peak figure of army strength, 2,920,000 (attained in June 1945) fell nearly a million short of that for the First World War.

The pattern of military development in the years following 1945 has been very different from that of the inter-war years. The age and service release scheme on which the Second World War demobilisation was based, did not come to an end until April 1949. Within a few years after demobilisation international tension caused a considerable increase in the number of men serving with the colours. By 1953 the strength of the active B. A. had risen to 451,400, a figure more than double the regular B. A. of the twenties and early thirties. National service was continued in peace time and it was not until the new defence policy of 1957, taking into full account the conditions of nuclear warfare, was announced, that its end could be envisaged.

In the reconstruction of the B. A. in the period immediately following the conclusion of hostilities, the diminished role of infantry in the Second World War was reflected in the measures adopted in dealing with the infantry regiments of the line. During the course of 1947 and 1948, their active army battalions were reduced from 2 to 1 by amalgamation and other means. (Eight of these 2nd battalions were resuscitated during the period of expansion in the early fifties but they disappeared again in 1955.) Though no corps of infantry was formed, the 64 line regiments were ranged in 13 brigades organised mainly on a geographical basis. The T.A. was reconstituted in 1947, and

a number of its units were converted to an armoured role.

The outbreak of the Korean war in 1950 and the B. A.'s heavy overseas commitments in Germany and elsewhere led to measures to strengthen the reserve forces. In 1950 an Army Emergency Reserve was created and to this and to the T.A. national servicemen who had completed their 2 years' service with the colours were directed for a part-time training period of 3½ years. In 1951 the wartime Home Guard was revived.

Since 1955, the relaxation of international tension and changed conditions of warfare have resulted in drastic alterations in the B. A.'s organisation. Overseas commitments have been considerably reduced and a beginning has been made with the development of formations adapted to nuclear warfare and the use of guided missiles. In 1955 a Mobile Defence Corps to supplement the work of the local civil defence units was formed. In the same year Anti-Aircraft Command was broken up and the Coast Artillery was disbanded in 1956. The need for small compact formations capable of independent action has resulted in the abolition of 2 T.A. armoured divs. and the amalgamation of a number of armoured yeomanry regiments. A guided-missile regiment was formed at the beginning of 1957. All these factors have resulted in a substantial reduction in manpower requirements. By 1962 it is envisaged that the active B. A. will be composed solely of personnel on regular engagements. Already in 1957 the T.A. has reverted to its former voluntary basis and national servicemen are no longer directed to it for part-time training.

In July 1957 details were issued of changes in the organisation of the B. A. (War Office White Paper, Cmd. 230), in connection with the decision to reduce the size of the armed forces in general. The reorganisation is scheduled for completion by the end of 1962. It was planned to reduce the number of line cavalry and infantry regiments by amalgamation to 17 and 48 respectively and to make corresponding reductions in the strengths of the other regiments and corps. See REGIMENT.

Organisation and administration. The body in which control of the B. A. is vested is the Army Council, set up in 1904, following the abolition of the office of Commander-in-Chief (q.v.). The Army Council now consists of 8 members, 3 civilian and 5 military. At its head is the secretary of state for war, who is responsible both to the sovereign and to Parliament for all matters relating to the B. A. The other 2 civilian members are the parliamentary and the permanent under-secretaries of state for war. The first acts as vice-president of the council and deputies for his chief in Parliament and the second is a civil servant who is mainly responsible for financial matters. The 5 military members are the Chief of the Imperial General Staff (C.I.G.S.), the Vice-Chief of the Imperial General Staff (V.C.I.G.S.), the Deputy Chief of the

Imperial General Staff (D.C.I.G.S.), the Adjutant-General, and the Quartermaster-General. The C.I.G.S. is the senior military member, and through the V.C.I.G.S. deals with military operations and intelligence, and through the D.C.I.G.S. with training, weapons, and equipment, and the Reserve Army (T.A., etc.). The Adjutant-General's responsibilities are manpower and recruiting, discipline, welfare, and other personnel matters, the medical services, etc. Under the Quartermaster-General come all matters relating to supply, transport, and maintenance.

To avoid over-centralisation, the B. A. is divided into a number of commands. Those at home are E., N., Scottish, S., and W. Commands, and N. Ireland Dist. (The last named is a local dist. with command status.) Those abroad are Middle E. Land Forces, Far E. Land Forces, and B. A. of the Rhine. Prior to the Second World War there was also an Aldershot Command and at the time of the threat of invasion in 1940 a S.E. Command was formed. Commands were first estab. as Army Corps Distts. in 1901 (the present designation was adopted in 1905). During the course of the Second World War they were given much greater authority and this they still enjoy.

The B. A. is made up of an Active and a Reserve Army. The Active Army is composed of those performing full-time service, either national servicemen or those serving on a regular engagement. Its strength at the end of 1956 was:

Male Officers:		
Regulars . . .	18,758	
Short Service . . .	5,342	
Extended Service . . .	2,612	
National Service . . .	4,258	
Others . . .	56	
	-----	31,026
Male Other Ranks:		
Regulars . . .	162,383	
Short Service . . .	1,538	
National Service . . .	178,327	
	-----	342,248
Boys: . . .		4,274
Women:		
Officers . . .	1,349	
Other Ranks . . .	4,951	
	-----	6,300
Total . . .		383,848

At the beginning of 1957 plans for a drastic reduction of the armed forces were announced. It was estimated that at the end of 1962 these would total about 375,000 of which the Active Army's share would be a little over two-fifths. This reduction in numbers would be coupled with a discontinuance of national service.

National service as a method of recruiting the Active Army had first been introduced during the First World War, but had been discontinued at the armistice. It was introduced for the first time in peace time in 1939 and was continued after the conclusion of hostilities in 1945. In the immediate post-war years the

period of service was 18 months but was extended to 2 years in 1949.

Regular service in its present form was first introduced in 1871. Prior to 1847 enlistment was for life; but in that year it was reduced to 10 years. The 1871 Short Service Act brought into being the system of a short period of service with the colours followed by a period with a reserve obligation. At present those who enlist for 3 years have a reserve obligation of 4 years, those who enlist for 6 years remain in the reserve for 3 years. There are, however, arrangements for a 22-year period of service, with release rights at 3-yearly intervals.

The Reserve Army includes the T.A. and the Army Emergency Reserve. The T.A. came into being in 1908 and was formed in the main from units of the volunteer force. As its title implies it is a force with an essentially local basis and the detailed administrative work in connection with it is carried out by co. Territorial Associations. Originally recruited on a purely voluntary basis during the years following the Second World War, national servicemen were directed into it to complete their service obligation. After 2 years' full-time service with the Active Army, they were required to undertake 34 years part-time training with the T.A. At the beginning of 1957 it was announced that national servicemen would be no longer directed to the T.A. and that this force would revert to its former purely voluntary basis. Though service with the T.A. is normally only a part-time obligation its members may be embodied for permanent service in any part of the world when the B. A. reserve is called out by proclamation; and they may be called out without a proclamation for the defence of the U.K. The 1957-8 Army Estimates made provision for a total T.A. strength of 285,000, including 5000 in the women's corps.

The Army Emergency Reserve (A.E.R.) formed in 1950 is the successor of the Special Reserve and the Supplementary Reserve. These 3 reserves have existed side by side with the T.A.; the first of them, the Special Reserve, was estab. in the same year. Though recruited on the same basis as the T.A. their organisation and functions have been markedly different. Territorial units have always retained their distinctly local character, those in the A.E.R. have been organised centrally and have been closely integrated with their regular counterparts. This has in the main been due to the fact that the latter have to a large extent consisted of technical and specialist personnel needed to bring the appropriate regular units up to strength or mobilisation. The formation of the Mobile Defence Corps in 1955 and the inclusion of this corps in the A.E.R. has meant a considerable increase in the A.E.R.'s strength. The 1957-8 Estimates provide for an A.E.R. estab. of 12,000 officers and 203,000 other ranks.

Supplementary to the T.A. and the A.E.R. there is the Home Guard (q.v.). This local defence force of the Second

World War period was revived in 1951. In the years immediately following its revival the Home Guard was organised on a cadre basis in certain parts of the country and in others provision was made for full battalion strength. It is now organised on a cadre basis only. The Active and the Reserve Army are together made up of the following arms and services: Household Cavalry; Royal Armoured Corps; Royal Regiment of Artillery; Corps of Royal Engineers; Royal Corps of Signals; Regiments of Foot Guards; Regiments of Infantry of the Line; the Glider Pilot Regiment; the Parachute Regiment; Special Air Service Regiment; Brigade of Gurkhas; Royal Malta Artillery; Royal Army Chaplains' Dept; Royal Army Service Corps; Royal Army Medical Corps; Royal Army Ordnance Corps; Corps of Royal Electrical and Mechanical Engineers; Corps of Royal Military Police; Royal Army Pay Corps; Royal Army Veterinary Corps; Military Provost Staff Corps; Royal Army Educational Corps; Royal Army Dental Corps; Royal Pioneer Corps; Intelligence Corps; Army Physical Training Corps; Army Catering Corps; Queen Alexandra's Royal Army Nursing Corps; Women's Royal Army Corps; Mobile Defence Corps.

The Household Cavalry comprises the Life Guards and the Royal Horse Guards. Both are organised as armoured car regiments, but provide mounted squadrons which are employed on state and ceremonial occasions. The Royal Armoured Corps is made up of the cavalry of the line, Dragon Guards, Dragoon Guards, Hussars, and Lancers, all of which have now been mechanised, their Territorial counterparts, the Yeomanry Regiments, and the Royal Tank Regiment. The Brigade of Guards consists of 5 regiments of Foot Guards (Grenadier Guards, Coldstream Guards, Scots Guards, Irish Guards, and Welsh Guards). Neither the Household Cavalry nor the Brigade of Guards are represented in the T.A. The Infantry of the Line comprises 64 regiments linked on the basis of local or traditional affinity into 13 brigades, e.g. the Lowland Brigade (the Royal Scots, the Royal Scots Fusiliers, the King's Own Scottish Borderers, and the Cameronians), and the Light Infantry Brigade (the Somerset Light Infantry, the Duke of Cornwall's Light Infantry, the Oxfordshire and Buckinghamshire Light Infantry, the King's Own Yorkshire Light Infantry, the King's Shropshire Light Infantry, and the Durham Light Infantry). The line infantry regiments all have regular battalions and either Territorial battalions or Territorial regiments linked with them. Of the remaining corps and regiments most have Territorial as well as Active Army units and personnel. Among the exceptions are the Military Provost Staff Corps, the Mobile Defence Corps, and the Brigade of Gurkhas. The Mobile Defence Corps forms part of the A.E.R. The Brigade of Gurkhas is one of the 2 corps not raised in the U.K. which form an integral part of the B. A. (the other is the Royal

Malta Artillery). The Brigade of Gurkhas is made up of 4 regiments which formed part of the Indian Army before 1947 (then 2nd, 6th, 7th, and 10th Gurkhas), together with engineers and signals units. The Royal Malta Artillery, unlike the Gurkhas, includes both Active Army and Technical personnel.

In addition to the corps and regiments listed above there are a number of local colonial units which come under direct War Office control and are linked with the B. A. These include the local forces in Gambia, Nigeria, Sierra Leone, Brit. Somaliland, Aden Protectorate, Gibraltar, and Jamaica, together with the Trucial Oman Scouts. The King's African Rifles which were taken over by the War Office at the beginning of the Second World War reverted to colonial control in 1957. It is anticipated that the units of the Royal West African Frontier still under War Office control will pass to the local administrations during the course of the next few years. (This has already happened in the case of the Ghana units.)

British Army pay. The system and rates of service pay and pensions were revised in 1958 (Cmd 365). The new codes of pay incorporated many changes designed to produce an increase in the numbers and experience of the regular forces. The new rates of pay would, it was hoped, lead suitable men and women to adopt a service career. A recruit would receive a higher rate of pay if he undertook to serve 6 years instead of 3, with a further increase for a 9-year commitment. The new rates were also designed to dissuade the regular soldier already serving in a short engagement from seeking release. In the B. A. there is now a common pay scale in the case of corporals and ranks below. Increases, whether for tradesmen or non-tradesmen, are governed by the qualification stars awarded to the individual and the period of service he has undertaken. A private soldier may have any one of 24 different rates of pay, a corporal any one of 28, and a sergeant any one of 16.

The minimum and maximum rates are given in the table opposite.

Increments of 7s. a week are paid to sergeants and of 10s. 6d. to staff sergeants and warrant officers on completion of 22 years' service. Bounties of £150 are paid to men who have undertaken 9 years' service and who agree within the 9 years to complete 22 years, and £100 to men who have undertaken 12 years' service who agree to complete 22 years. Additional pay ranging from 15s. 9d. to 43s. 3d. is granted for flying and similar duties. The marriage allowance, minimum rate, is 56s. a week in quarters, 77s. for others.

A new scale of pensions was introduced in 1956. Terminal grants were also increased in such a way that a private after 22 years' service receives £125, and a warrant officer £330.

The new code scales show a marked improvement on those in force before the Second World War. Then a recruit on entry into the service received 14s. a week; now his weekly pay is 84s. The

SERVICE UNDERTAKEN

		Under 6 years	6 years but under 9 years	9 years or more	15 years having completed 9	21 years having completed 15
		s. d.	s. d.	s. d.	s. d.	s. d.
Private	Min. (recruit)	84 0	101 6	122 6	122 6	122 6
	Max. (7 star)	133 0	147 0	171 6	171 6	171 6
Lance-Corporal	Min. (1 star)	98 0	115 6	136 6	136 6	136 6
	Max. (7 star)	147 0	161 0	185 6	185 6	185 6
Corporal	Min. (1 star)	112 0	129 6	150 6	161 0	161 0
	Max. (7 star)	161 0	175 0	199 6	210 0	210 0
Sergeant	Min.	178 6	182 0	206 6	220 6	227 6
	Max.		213 6	238 0	252 0	259 0
Staff Sergeant	Min.	199 6	203 0	227 6	241 6	248 6
	Max.		234 6	259 0	273 0	280 0
Warrant Officer II	Min.	231 0	234 6	238 0	259 0	269 6
	Max.		245 0	269 6	290 6	301 0
Warrant Officer II (R.Q.M.S.)	Min.	238 0	241 6	245 0	266 0	276 6
	Max.		252 0	276 6	297 6	308 0
Warrant Officer I	Min.	215 0	248 6	252 0	273 0	283 6
	Max.		259 0	283 6	304 6	315 0

trained infantryman received 21s. a week in 1939; the amount is now 133s. The 1958 code rates of pay for commissioned officers are intended to offer terms which can stand comparison with salaries in civil life. The standard rates for regular officers are as follows:

	£ per year
Second Lieutenant	456
Lieutenant	517
after 3 years' service in the rank	657
Captain	766
after 6 years' service in the rank	985
Major	1149
after 8 years' service in the rank	1368
Lieutenant-Colonel with less than 19 years' service	1533
after 8 years' service in the rank	1752
Colonel	1934
after 6 years' service in the rank	2208
Brigadier	2299
Major-General	3029
Lieutenant-General	3759
General	4489
Field Marshal	5219

The marriage allowance for captains and commissioned ranks below is £355 (quarters) and £410 (others). The corresponding allowances for majors are £401 and £456, lieutenant-colonels and colonels £456 and £511, for brigadiers £520 and £574, and for those above the rank of brigadier £611 and £666. Additional allowances are paid under certain circumstances for rations, outfit, fuel and light, etc. Qualification pay, varying from 3s. 6d. a day for lieutenants to 7s. a day for majors, is paid to officers possessing certain qualifications. Officers in the Royal Engineers, Royal Corps of Signals, and Royal Electrical and Mechanical

Engineers may receive special qualification pay of 3s. a day. Retired pay and terminal grants were both revised in 1956. Regular officers now receive on retirement pay and grants as follows:

	Retired Pay £ per year	Terminal Grants
Captains and below	500	1500
Major	625	1875
Lieutenant-Colonel	800	2400
Colonel	1000	3000
Brigadier	1150	3450
Major-General	1400	4200
Lieutenant-General	1600	4800
General	1900	5700
Field Marshal	2300	6900
('Half Pay')		

See AMMUNITION; ARMOUR; ARMS; ARTILLERY; CADET FORCE; CAVALRY; COMMANDO; COMMISSION, MILITARY; CONSCRIPTION; COURTS MARTIAL; DEFENCE, MINISTRY OF; ENGINEERING, MILITARY; FORTIFICATION; HOME GUARD; INFANTRY; MECHANISATION AND MOTORISATION, MILITARY; MEDICAL SERVICES, ARMY; MILITARY EDUCATION AND MILITARY SCHOOLS; MILITARY LAW; MILITARY VEHICLES; MILITIA; MOBILE DEFENCE CORPS; RANKS; RECONNAISSANCE; REGIMENT; REGIMENTAL MARCHES; RESERVE ARMY; SANDHURST; SIGNALS; STAFF, MILITARY; STRATEGY AND TACTICS; TANKS; TERRITORIAL ARMY; TRANSPORT, MILITARY; UNIFORM (MILITARY); WAR GRAVES; and under names of individual regiments. See J. S. Omond, *Parliament and the Army, 1642-1904*, 1933; J. K. Dunlop, *The Development of the British Army, 1800-1914*, 1938; C. C. P. Lawson, *A History of the Uniforms of the*

British Army to 1760, 1939-41; D. H. Cole and E. C. Priestley, *An Outline of British Military History* (3rd ed.), 1945; E. W. Sheppard, *A Short History of the British Army* (4th ed.), 1950; W. G. Lindsell, *Military Organisation and Administration* (28th ed.), 1953; H. de Wavertille, *The British Soldier*, 1954.

British Association for the Advancement of Science, founded at York in 1831 with the object of promoting the advancement of science in all its branches. An important additional function to-day is the creation of a better understanding of the significance of scientific research, and its

any form of nomination is necessary for membership, which is open to all who are interested in science, H.Q. are at Burlington House, London, W.

British Broadcasting Corporation, see BROADCASTING.

British Columbia, prov. of Canada. Its boundaries are Yukon and NW. Ters. on the N.; the U.S.A. on the S.; Pacific Ocean and Alaskan 'panhandle' on the W.; and prov. of Alberta and Rocky Mts on the E. Estab. area, including Vancouver Is. and Queen Charlotte group, 366,255 sq. m. For years the ter. was little more than the fur preserve of the



LAKE OKANAGAN, BRITISH COLUMBIA

Part of the 'Okanagan-Cariboo Trail' near Penticton.

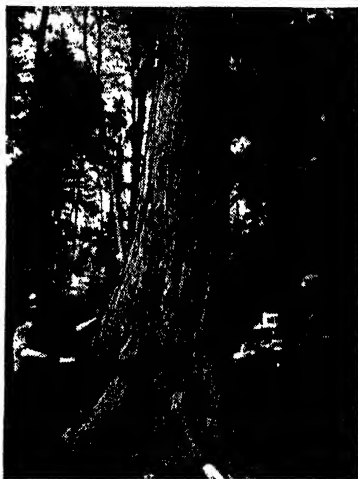
impact, through its applications, upon society. The objects of the B. A. are achieved by ann. meetings, held in different cities of the U.K. in late Aug. or early Sept., conferences, research committees, collaboration with other scientific organisations, and pubs. The prin. pub. of the B. A. is *The Advancement of Science*, pub. quarterly. In addition to the presidential address, the programme of the meeting includes papers and discussions in 13 sections (mathematics and physics, chemistry, geology, zoology, geography, economics, engineering, anthropology and archaeology, physiology, psychology, botany, education, and agriculture), and the assembly of corresponding societies; excursions, exhibitions, demonstrations, and social events. The meeting provides many opportunities for informal discussion and contact between scientists and between scientists and laymen. No scientific or technical qualification nor

Hudson's Bay Co. In 1849 Vancouver Is. was given crown colony status and in 1853 the Queen Charlotte Is. became a dependency. The discovery of gold on the Fraser R. and the influx of pop. which followed resulted in the creation in 1858 of the mainland crown colony of B. C. to which the Stikine Ter. (estab. 1862) was later added. In 1866 the 2 colonies were united, and on 20 July 1871 the united colony joined the Canadian federation. The prov. is remarkable for its physical diversity. Main features are mt systems trending roughly parallel north-westerly and separating intermontane valleys, lake basins, and plateaux. The Rocky Mts (highest peak, Mt Robson, 12,972 ft) flank the E., while the W. is occupied by the Coast Range (highest peak, Mt Waddington, 13,260 ft). Between the Rocky Mts and the Coast Range lies a vast plateau system having elevations of 3000-4000 ft, and cut by deep riv. valleys.

Of the numerous rivs. the chief are the Fraser, Columbia (its upper course only), Skeena, Stikine, Peace, Liard, and the Nass. The Fraser, 695 m. long, is navigable by ocean steamships as far as New Westminster. The coast-line is deeply indented with many long and narrow inlets forming excellent harbours. There are sev. well-known passes over the Rockies, including the Kicking Horse Pass and Crow's Nest Pass, used by 2 branches of the Canadian Pacific Railway, and the Yellowhead Pass, crossed by the Canadian National Railway. The climate is as diverse as the physiography. The prov., spreading over 11 degrees of lat., with an average width of 700 m., has, within its own limits, climates which differ greatly. The littoral region is mild and humid, while the interior valleys and plateaux, with their high altitude, have colder and drier winters.

On the lower mainland the climate is everywhere equable and mild. Spring opens early, the summers are warm, and the winters mild and rainy. The pop. was 36,247 in 1871, of whom about 10,000 were whites. In 1947 the pop. was estimated at 1,044,000, of whom about 80 per cent were of Brit. stock. Victoria (Greater) (pop. 123,033), on Vancouver Is., is the cap. Other cities and tns on the is. are Nanaimo (pop. 12,570), Ladysmith, Duncan, and Port Alberni. The cities on the mainland include New Westminster (pop. 31,357), the old cap., and Vancouver. Vancouver (Greater) was founded in 1886, and has a pop. of 658,813 (1956); it is the largest city in the prov., and the third largest in all Canada. It is the W. terminus of the Canadian Pacific Railway, and possesses one of the finest natural harbours in the world. Also on the mainland is Prince Rupert (pop. 10,381), the most northerly city of its size in the dominion. From B. C. 6 members are sent to the dominion Senate, while 22 are entitled to a seat in the Federal House of Commons. The queen is represented by a lieutenant-governor appointed by the governor-general in council, and governing with the advice and assistance of a ministry or executive council. He is assisted by a prov. legislature of 52 members. The franchise is exercised by all persons, male and female, of full age of 19 years, who are Brit. subjects and have resided within the prov. for 6 months. Education is free and compulsory; there are about 80 high schools and over 1000 elementary schools. The univ. of B. C., situated near Vancouver, was founded in 1908 and opened in 1914. It is endowed by the prov. gov. The chief regions of settlement are in the S. part of the prov., on Vancouver Is., and in N. Central B. C. Particularly favoured are the valleys, which radiate southward from the mt. systems, notably Windermere, Kootenay, and the Okanagan, which, together with the Fraser R. valley, constitute probably the most fertile areas in the dominion. In 1930 the prov. became repossessed of its railway land and the Peace R. block. The lands, originally

assigned to the dominion gov. under the terms of confederation, comprise an area 40 m. wide across the prov. from E. to W. The Peace R. block is an area of 3,500,000 ac. exceptionally rich in fertility and natural resources. Together they represent many millions of ac. of crown lands within easy distance of transportation and ripe for settlement. Approximately 36,000 sq. m. in the prov. are estimated as available for agriculture, and about 800,000 ac. are cultivated. Fruit-growing, dairying, and mixed farming, together with poultry raising and the cultivation of small fruits, have all registered remarkable



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FELLING A TREE BY POWER SAW IN
BRITISH COLUMBIA

progress in the prov. during the past few years. Other industries are mining, fishing, and lumbering. The mineral wealth of the prov. is very great. The prin. metals won are gold, placer and lode, silver, copper, lead, zinc, and coal. Other deposits include iron, both hematite and magnetite, galena, mercury, platinum, antimony, bismuth, plumbago, mica, and molybdenum, but these deposits are for the most part undeveloped. The development of hydro-electric power, for which there is an enormous potential, has been increased rapidly, and has resulted in many new industrial projects, as, for example, the reduction of aluminium at Kitimat. Numerous salmon canneries are in operation, and cod, halibut, and herring are also taken in great quantities. An industry of recent growth in connection with the fisheries is fish reduction, and numerous plants are now in operation. The chief industry of the prov. is lumbering. B. C. forests hold the greatest stand

of softwood in the Brit. Empire, estimated at approximately 360 billion ft of saw-timber. Douglas fir, red cedar, spruce, and hemlock are the chief woods. The prov. is in many respects the most favoured part of Canada, and particularly so in respect of its geographical position. Standing in the same relation to the Pacific Ocean as the U.K. does to the Atlantic the prov. is destined to become the great *entrepôt* for trade between the Orient, Australia, and the dominion. Before the Second World War some 54 steamship lines made Vancouver their port of call, and the port handled yearly 100,000,000 bushels of wheat for export. The other chief exports are fish, coal, gold, silver, minerals, timber, fruit, pulp, and paper. The prov. is traversed by 5000 m. of railway, and over 20,000 m. of gov.-built roads. The Canadian Pacific Railway has 3 main lines in the prov. and the Canadian National Railway 2. Branches connect with the U.S. railway system. The Pacific Great E. railway, owned by the prov., runs through it from N. to S. The Alcan highway runs from Fort St John, B. C., to the Yukon boundary and thence via Whitehorse and Dawson to Fairbanks in Alaska.

See A. Short and A. G. Doughty, *Canada and its Provinces: British Columbia*, 1914; B. A. Mackelvie, *Early History of British Columbia*, 1926; G. Howay, *British Columbia*, 1928; O. W. Freeman and H. W. Martin, *The Pacific Northwest*, 1942.

British Columbian Pine, see DOUGLAS FIR.

British Commonwealth and Empire, free association of 10 sovereign member states—the U.K., Canada, Australia, New Zealand, the Union of S. Africa, India, Pakistan, Ceylon, Ghana, and Malaya—and their dependencies.

Formerly the *ters.* of the B. C. were recognised by their link with the Brit. Crown; but both the dominions of India and Pakistan are now *rops.*, but remain nevertheless members of the B. C. These dominions accept the queen as the symbol of the free association of the *sev. indep.* members of the B. C., and, as such, as head of the Commonwealth. The extent of the B. C. is conveyed graphically in the hackneyed but none the less true phrase 'the empire upon which the sun never sets,' for of the whole area of the land surface of the globe the B. C. occupies about one-fifth. In fact, of the 52,500,000 sq. m. which is roughly the extent of the land surface of the earth, the B. C. occupies about 14,000,000 sq. m. The Commonwealth is fairly evenly divided as between the N. and S. hemispheres, but from the other possible div., i.e. in the E. and W. hemispheres, the greater part of it lies in the E. The Commonwealth contains some of the loveliest and most productive of all lands in the world, lands that contain great agric. and mineral wealth. It has amongst its *rivs.* the largest and the greatest in the world, and part of it is bounded by the greatest chain of mts in existence. The types of race found in the

pop. of the B. C. are many and various. The pop. of the whole B. C. is probably about one-quarter that of the entire globe.

The sovereign states of the B. C. are the U.K., Canada, Australia, New Zealand, the Union of S. Africa, India, Pakistan, Ceylon, and Ghana (Gold Coast), and the Federation of Malaya became self-governing in 1957. The Irish Free State (now called the Rep. of Ireland) was created a dominion in 1922, but in Nov. 1948 the Eire Gov. by introducing the Republic of Ireland Bill took steps to remove the last vestige of Eire's constitutional partnership in the Commonwealth, though the Brit. Gov. declared that they would not regard the enactment of this legislation as placing Eire and its citizens in the category of foreigners (*see IRELAND, History*). Burma also became an independent state outside the B. C. after the Second World War. India, until the Second World War, was an empire, ruled over by a sovereign-emperor, the sovereign of England. It became the dominions of India and Pakistan in 1947. The Federation of Rhodesia and Nyasaland is self-governing in federal matters. Of its components, S. Rhodesia is self-governing in all but external affairs and defence, though the U.K. retains some reserve powers in respect of native policy. N. Rhodesia and Nyasaland retain the status of protectorates in all non-federal affairs. The U.K., Australia, and New Zealand are responsible for the administration of certain *ters.* as colonies, protectorates, protected states, or trust *ters.* Colonies are those *ters.* that have been annexed to the Crown, e.g. the W. Indies, Cyprus, Mauritius, Sarawak, Hong Kong. Protectorates have not been annexed, and their inhab. are not Brit. subjects like those of the colonies, but Brit. protected persons; otherwise there is little practical difference between the 2 forms of administration. Examples of protectorates are Uganda and Zanzibar in Africa and the Brit. Solomon Is. in Oceania. For historical reasons some *ters.* have a dual status, being part colony, part protectorate; examples are Nigeria and Kenya. Protected states are countries that, while retaining their sovereignty, have by treaty delegated certain rights and responsibilities to the U.K. gov.; e.g. Brunei in the is. of Borneo and Tonga in the Pacific. Trust *ters.* are former dependencies of powers defeated in war whose administration has been entrusted to one of the Commonwealth countries by the U.N. until they are fitted to govern themselves. Trusteeships replaced the League of Nations mandates when the League gave place to the U.N.O. Former mandated *ters.* now independent include Israel, Iraq, and Jordan. Tanganyika in E. Africa is a U.K. trust *ter.*, W. Samoa in Oceania is a New Zealand trust *ter.* Togoland, the former Ger. colony in W. Africa, was divided in 1918 into Brit. and Fr. mandated *ters.*, the Brit. zone being administered by the gov. of the Gold Coast. It now forms part of Ghana. The most important of the former protectorates of the B. C., Egypt, was created

a sovereign independent state again in 1922. The Sudan, formerly a condominium administered jointly by the representatives of the Brit. and Egyptian govts., under a Brit. governor-general (see also SUDAN), is now an independent state also.

Races. As may be imagined, in an area comprising one-fourth of the earth's inhab. and one-fifth of its land area, every kind of race and colour is to be found. In sev. places, e.g. Australia and Canada, white immigrants have virtually supplanted the original inhab. In others, e.g. S. Africa, the white minority pop. completely controls the administration. The vast majority of the pop. of India is of Aryan stock; there are, however, many descendants of the Dravidians (q.v.), whom the Aryans overcame on their descent into India 3 or 4 millenniums ago. In Ceylon are to be found the Sinhalese and Tamils, both of ant. culture. The Malay states have a brown pop., with nearly as many Chinese, the latter being immigrants of comparatively recent times. In S. Africa the aboriginal Bushmen and the Hottentots are still to be found, although in greatly diminishing numbers, the bulk of the native races belonging to the Bantu stock as is the case in Brit. central Africa. These Bantu (q.v.) are divided into many tribes; and there is a growing element in the Union of S. Africa as also in Brit. E. Africa, of Asiatic (chiefly Indian) immigrants. The people of the W. Indies (q.v.) are mainly Negroes (q.v.) or coloured, the descendants of African slaves with or without admixture of European blood. The white community is descended from Brit. immigrants. A few of the aboriginal tribes survive, and there are minorities of Indian and Chinese stock. There are still Red Indians in Canada, though they are few in number, and in the N. of that ter. are to be found the Eskimoes, a Mongoloid race. In Australia a pre-Dravidian race still exists, but its members are rapidly disappearing through their inability to adapt themselves to the customs of the whites. The natives (Maoris) of New Zealand, of Polynesian origin, are, on the other hand, entirely adaptable and are now increasing. The Pacific is. are inhabited by various primitive tribes.

British nationality. A new scheme of nationality legislation, whereby each member of the Commonwealth would define its own citizens while maintaining as far as possible a common status distinguishing citizens of all members from the nationals of foreign states, was inaugurated by the passing in the U.K. of the British Nationality Act, 1948, and of corresponding legislation in other Commonwealth countries. The situation in this respect is dealt with in detail in the article (pp. 76-82) in the *Commonwealth Relations Office List*, 1952, headed 'Commonwealth Nationality and Citizenship' (H.M.S.O.).

Religions. All the important religions of mankind are to be found in the B. C., together with the lowest sort of fetish worship. The white inhab. are Christians,

Protestants predominating. It is sometimes pointed out that the B. C. contains more Muslims than Christians; these are mainly in the African and Asiatic ters., particularly in Pakistan, which is known as the 'Islamic Rep. of Pakistan'. Buddhism flourishes in Ceylon. Many Africans are pagans, but large numbers are Christians or Muslims.

History. The B. C. owes its origin not to any excess of pugnacity or acquisitiveness in the Brit. nation, but to the fact that the British are a trading people. The Commonwealth grew with the development of overseas trade, and though there is an element of truth in the old maxim that 'trade follows the flag,' the flag—that is, the army and the administrator—has not seldom followed the trader and, sometimes, the missionary. At the opening of the period of overseas trading in 1583 England acquired its first colony, Newfoundland, of which possession was taken by Sir Humphrey Gilbert, and thereafter settlement overseas for trading purposes or the development of plantations was of frequent occurrence.

The dependencies of Great Britain can be very roughly divided into 2 groups, the larger producing ters. such as the Federation of Nigeria, Kenya, and the W. Indies (the dominions are, of course, still larger producing ters., but they are no longer 'colonies' in any sense), and the smaller colonies, which serve or have served as the stepping-stones between the homeland and its colonies. These smaller links of the Commonwealth are the coaling stations, the cable or wireless stations, and the naval harbours for the ships protecting the trade routes against enemy craft, privateers, or pirates. Gibraltar, Aden, Malta, Bermuda, and the Maldives afford instances of such links, and these are also valuable as air bases. Even before the days of steam as a motive power for ships and of cables for commerce, there was the need—greater indeed than now—for the trading vessels to call at friendly ports for supplies of food and water. Wherever, therefore, a well-estab. Brit. trade route lies, these smaller linking colonies are found. The 3 prin. trade routes are: (1) to the E., via the Mediterranean; (2) to the New World; and (3) to the Antipodes. Until the opening of the Suez Canal, the route to India and the Far E. was via the Cape of Good Hope. Along these sev. routes the British acquired the following ters., some of which have since become independent and some of which have been merged with other administrations: (1) To the E., via the Mediterranean and Red Seas: Gibraltar (1704); Malta (1814) (recognised as part of the B. C.); Cyprus (1878); Egypt (now independent) (1882); Aden (1839); Ceylon (1796); Straits Settlements (1786-1846—Penang ceded in 1786; Singapore, purchased 1819; Malacca, ceded in 1824; Labuan ceded in 1846); and Hong Kong (1841). (2) To the New World: Barbados, in the first half of the 17th cent., Jamaica (1655); and Trinidad (1797). (3) To the Antipodes and the former route to India via the

Cape; Sierra Leone (1787); Gold Coast—a small company gained a footing in the 18th cent.; gov. first assumed control in 1821, but withdrew and resumed control in 1850; St Helena (1659); Ascension and Tristan da Cunha (1815); Cape Colony (1806); Mauritius (1810); Seychelles (1794); and then on to the Far E. by the older route first mentioned. As for the larger ters., or those which are now no longer called colonies but self-governing dominions, their acquisition (or loss, as in the case of the U.S.A.) was naturally a longer process. India was conquered largely in the latter part of the 18th and the first half of the 19th cent., mainly

traced since 1783, when the Amer. colonies were finally lost, from the early 19th-cent. mixture of humanitarianism and commercial zeal; through the pessimism of the middle of the cent., when it was popularly held that the empire was on the verge of breaking up; to the outburst of imperialist fervour under the influence of Cecil Rhodes and Joseph Chamberlain at the end of the cent., and the sobering shock of the S. African war; followed by the growth of dominion status (q.v.); encouraged by the comradeship of the First World War, and culminating in the Statute of Westminster, 1931. But among the material things that have



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BUILDERS OF THE COMMONWEALTH AND EMPIRE

Cabot, Hudson, Drake, Smith, Raleigh, Dampier, Penn, Anson, Chatham, Wolfe, Clive.

through military operations against Fr. rivals for settlement, the conquest of Burma, in further India, being completed in 1882. Canada was in the main settled in the 19th cent., though the provs. of Ontario and Quebec were conquered in 1759. Australia and New Zealand were settled in the first half of the 19th cent.; S. Africa was part settled and part conquered in the period 1850-1900; and other of the African colonies were acquired during the 'scramble for Africa' in the seventies and eighties of last cent.

The foregoing is a brief account of how the greater part of the B. C. came to be acquired. It is important, however, in considering the Commonwealth as an entity, to remember that it is an organism, and that side by side with the processes of growth are to be found the tendencies to decay. If a commonwealth is to grow, or even to maintain its position, the forces of growth must be stronger than those making for disruption. A unifying imperial sentiment and theory may be

served to keep the B. C. united are advances in science as applied to transport and communication. The steamship, the railways (notably the Canadian Pacific), the telegraph cable of the 19th cent., and the aeroplane, radiotelegraphy, and radiotelephony (including broadcasting) in this cent. have all played their part in the process of consolidation. The wide range of modern newspapers and news services is also a unifying factor. On the other hand, various inevitable developments tend to operate against Commonwealth unity. There has been, particularly since the First World War, an awakening or emphasising of racial consciousness, a craving for political expression in self-governing legislative and executive bodies—in a word, the demand for self-determination (q.v.) (see NATIONALISM). It is a remarkable tribute to Brit. colonial rule that so many former colonies, and not merely those peopled principally by descendants of Brit. immigrants, have decided to remain within the B. C. on achieving full

nationhood. No other empire can point to such an achievement.

Trade and finance. Despite the industrialisation of the Commonwealth—Canada, for example, is now one of the largest manufacturing nations of the world—there is no doubt that after the First World War Great Britain's trade with the overseas territories grew, while at the same time her trade with other countries declined, a process which was enhanced by the Ottawa Agreements (q.v.) of 1932. Since the Second World War, however, this tendency has not on the whole been maintained. Besides the trade between the colonies and the homeland, there is a

of the mother country and of each other, though in nearly all cases they grant a preference to such goods, as against those of other countries. In the same way that the dominions and one or two of the self-governing colonies have fiscal autonomy, they also have the power to borrow in the home or other countries. Before 1914 practically all colonial loans were floated on the London market, but after 1918 the U.S.A., having passed from a debtor to a creditor nation, received applications from various dominions, and state and industrial loans were secured from the New York money market. This process has gone far in Canada, for even in 1926



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Cook, Pitt, Hastings, Raffles, Durham, Sturt, Brooke, Lawrence, Gordon, Livingstone, Rhodes.

growing direct trade between dominion and dominion, while certain dominions (particularly Canada with the U.S.A.) do a large direct trade with their neighbours. The share held by Great Britain's exports in foreign markets, as distinct from those of the Commonwealth, amounted (before the Second World War) on the average to about 20 per cent, but her share of the Commonwealth markets was more than twice that amount. In the 4 years, 1910–13, immediately prior to the First World War the production of Brit. exports taken by the Commonwealth was about 35 per cent, but in 1926 this figure was about 10 per cent higher. Again, of the imports into Great Britain, those from the Commonwealth have risen in the last 70 years from 22 per cent of the whole to 30 per cent. In 1938 the value of Brit. merchandise consigned to empire countries or dependencies was £234,816,000, as against only £11,470,000 foreign and colonial. The dominions and colonies mostly seek to protect their nascent industries by tariffs, even against the goods

it was estimated that of the foreign capital invested in that dominion the share of the U.S.A. was 3 parts to 2 parts of Great Britain. On the other hand, that great dominion has since entered the money market herself and made investments overseas, particularly in the W. Indies and Lat. America. After the First World War Australia was a frequent borrower, as the country was rapidly developing and the needs of the war were large. The aggregate debt of the Commonwealth and of the federal state before the Second World War much exceeded the pre-1914 national debt of Great Britain, though more than half of this was raised in the Commonwealth itself. In 1930 an economic crisis occurred in Australia, and an effort was made to restrict the policy of too frequent recourse to borrowing. New Zealand also has been a frequent applicant for the assistance of the London loan market. The S. African Union, which produces the bulk of the world's gold, is also a frequent borrower in London, where the union's loans have

a good reputation. In this dominion a central reserve bank was estab. in 1921, a precedent which was followed by the Labour Gov. in New Zealand in 1938. India, in 1926, adopted a definite gold standard with the rupee fixed at 1s. 6d., as against the 1s. 4d. ruling before the First World War. India has borrowed much from the London market, but, with the rapid industrialisation of the country, has provided funds for her own industries. So far as the crown colonies are concerned, the policy of the home gov. has been to encourage development loans as a means of promoting trade to relieve exceptional unemployment. Thus colonies such as Kenya and Nigeria have benefited by the fructifying influence of London's gold. Under the Colonial Development and Welfare Act, 1940, ann. sums of £5,000,000 for development and £500,000 for research in the crown colonies were made available for 10 years from 1941. Subsequent Acts passed in 1945, 1950, and 1955 made a total of £220,000,000 available for like purposes during the period 1946-50, while the practice of surrendering the unexpired portion of grants to the Treasury was abolished.

Communications. Closely allied with trade and finance is the question of communications. These have been greatly strengthened in the last 3 or 4 decades, and particularly since the 2 world wars. To the older modest forms of transport and communication by steamer, railway, and cable have been added the air-line and radio telegraphy and telephony. There has been a tendency in recent years to restrict the construction of new railway lines, and to concentrate on good roads for motor traffic. The car is opening up the Commonwealth at a quicker rate than was the case when reliance was placed chiefly on railways. The sea still remains the most important highway of Commonwealth communication, but air traffic is growing in vol. and importance, and the most distant parts of the Commonwealth can now be reached in a matter of days by aeroplane. In the last 30 years great progress has been made in linking the Commonwealth by wireless, or radio, telegraphy, and telephony, competition between the newer forms of communication and the older one of cables doing much to reduce cable rates. Broadcasting, on short-wave lengths, has put Great Britain and the B. C. literally on speaking terms with each other, and done much to strengthen the ties of sentiment which unite the motherland with her remotest colonial possessions.

Defence. The problem of defence of the B. C. has naturally varied throughout the hist. of the Commonwealth. Perhaps the most striking departure in the early years of the 20th cent. was when the dominions assumed the responsibility of protecting their own coasts and commerce by their own navies. The Act enabling them to do this is, it is true, dated 1865, but marked developments in this direction have taken place only in the last 3 decades. Australia and Canada in particular now have fine navies which rendered much assistance in

the 2 world wars. In both world wars the Commonwealth played its part, contributing not only money but also men to the great struggles. As a corollary to this active participation in the wars, the dominions were represented at the peace conferences, and afterwards played their part as separate states in the Assembly and on the Council of the League of Nations, and, later, in the U.N. Assembly. Compulsory military training of their young manhood is now a part of the policy of sev. of the dominions. In the Second World War the dominions (the Rep. of Ireland remained neutral) all played a most prominent part, on land, on the sea, and in the air, and no less striking was their effort in the field of production. Notable contributions have been made in both world wars by the forces of the dependencies, particularly by E. and W. Africa, Rhodesia, Malaya, and Fiji.

Collaboration in imperial defence. A central organisation for defence was elaborated through the committee of imperial defence, following the report in 1904 of Lord Esher's War Office (Reconstitution) committee. This committee was abolished after the Second World War, when a defence ministry was created to discharge, *inter alia*, the tasks carried out before the war by the committee. Methods of collaboration between the various members of the Commonwealth are governed by the principle enunciated in the Statute of Westminster (1931). Though the dominions have a close interest in problems that affect the Commonwealth and empire as a whole, each of them has a special and distinct outlook on world affairs, dependent on its geographical position and its political and economic environment, and dominion govts. must retain full liberty of action. (The various dominions show increasing independence of action in the sphere of foreign affairs; during the Suez crisis in 1956, for example, New Zealand and Australia actively supported Brit. action, Canada and S. Africa maintained a non-committal attitude, while India, Pakistan, and Ceylon were actively critical.) Cooperation in Commonwealth defence has, therefore, always taken the practical form of promoting uniformity of organisation, training, and equipment, and maintaining close touch between staffs and interchanging officers in order to promote a common doctrine and outlook in military affairs. Collaboration in wartime between the forces from different parts of the Commonwealth has thus been easy and effective. During the Second World War no attempt was made to revive the Imperial War Cabinet of 1916-18, but this did not prevent the maintenance of a very close touch between the govts. of the Commonwealth and the making of common plans for military action and co-ordination of munitions production. After the war the U.K. Gov. proposed that there should be estab., in the caps. of each of the dominions, U.K. liaison officers who might join with the dominion chiefs of staff in studying regional security

problems. In 1947 Canada and the U.S.A. concluded a defence agreement which closely paralleled the procedure which has long been applied between the nations of the Brit. Commonwealth (interchange of individual officers, systematic exchange of observers, standardisation of arms and equipment, and availability of military, naval, and air facilities). One possible weakness in the Commonwealth as it now functions is the provision, tacitly accepted by the Imperial Conference of 1926, whereby the whole cost of defending its main highways of communication devolves on Great Britain alone. It is inevitable that members of the Commonwealth should at times pursue divergent and even contradictory foreign policies; indeed, this is a corollary of their complete independence. But there is, nevertheless, a continuous process of mutual consultation, in the form of prime ministers' and other ministerial and official conferences (see PRIME MINISTERS' MEETINGS), the day-to-day exchange of information and ideas through High Commissioners, and, for example, the close and continuous contact between Commonwealth delegations at the U.N. and other international organisations. All this indicates, and produces, a remarkable degree of agreement on basic principles, even where there are differences of emphasis, methods, or tactics.

Government. From the foregoing it will have been seen that for the larger part the Commonwealth is now self-governed, though there is naturally a wide difference between the degree of autonomy enjoyed by a dominion and that accorded to a self-governing colony. Even in the non-self-governing territories an increasing measure of responsibility is devolved upon the local govts., which in turn are increasingly representative of the local peoples. The W. Indian colonies, for example, and the 3 regions of the Federation of Nigeria, now enjoy a very high degree of self-gov. In times of acute crisis all or most of the units of the B. C. have in the past made common cause, as was shown in the war of 1939-45. This is facilitated by the consultative machinery of the Commonwealth. The queen is the symbol of the unity of the Commonwealth, and the smaller colonies and territories are ruled by governors and administrators appointed by the home gov., functioning through the Colonial Office, at the head of which is the secretary of state for the colonies. This official is always a member of the Brit. Cabinet, and until 1925 both 'dominion affairs' and the colonies were the concern of his dept. In July of that year, however, a new secretary of state for dominion affairs was created and a Dominions Office was estab. This took over from the Colonial Office business connected with the self-governing dominions. For a while the post of dominions secretary was also held by the colonial secretary, but in 1930 a separate minister was appointed for the former office. In 1947 the title of the Dominions Office was altered to 'Commonwealth Relations Office.' The dominion govts. now have their own envoys in

various foreign caps. and in each other's caps. Thus the sovereign independent status of the dominions has become accentuated. In its present form it would seem reasonable to suppose that the B. C., tested in the ordeal of 2 major wars, can form a 'core of stability' in the world which should help to make future world aggression highly improbable and promote equality of opportunity for all peoples, large and small. The measures which the constituent parts of the Commonwealth may take to ensure their own cohesion—itsself an essential factor in constructing the larger framework—will primarily depend on the extent to which each member of the Brit. combination understands the problems, characteristics, and circumstances of its fellow members. On the economic side of Commonwealth relations there has never been an attempt to create a closed economy or economic autarky either between the U.K. and the dominions or including the Colonial Empire; for, apart from the fact that any such attempt would have been contrary to the general trend of Commonwealth development, it would not even have been economically practicable.

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British Council, The, estab. in 1934 and

in 1940 granted a royal charter, by the terms of which its purpose is the promotion of a wider knowledge of the Eng. language and the U.K. abroad, and the development of closer cultural relations between the U.K. and other countries for the benefit of the Brit. Commonwealth of Nations. The greater part of its funds is derived from grants voted by Parliament, amounting for 1957-8 to about £3,500,000. The executive committee of 30 is composed of members drawn from both sides of the House of Commons, the univs., industry, the trades union movement, and

specialists from overseas. In 1958 the Council had staff in some 65 foreign and Commonwealth countries and 20 centres in the U.K. to provide study programmes and services for students, professional visitors, holders of U.N. fellowships and Colombo Plan awards and others from overseas. It is responsible for accommodation and welfare services for colonial and other students in the U.K.

British East Africa comprises the Brit. dependent territories of Kenya, Uganda, and Tanganyika (q.v.), with or without the protectorate of Zanzibar (q.v.). TI



TANGANYIKA

E.N.A.

African workers clearing virgin bush with the aid of a bulldozer.

other fields of Brit. life, and 9 members are nominated by ministers. The work is carried out under the guidance of advisory committees of experts who, like the unofficial members of the executive committee, give their services in the public interest. Activities include maintaining or assisting Brit. cultural centres, Anglo-phil societies, and Brit. schools abroad; the encouragement of Eng. language teaching and Brit. studies in univs., schools, and other institutions; and the projection of knowledge of Brit. life and thought, particularly in the fields of literature, science, medicine, engineering, agriculture, social studies, music, drama, the fine arts and architecture, through the medium of books and periodicals, films, exhibitions, lectures, concerts, and theatrical performances. Scholarships and bursaries for the study in the U.K. of Brit. institutions, methods, and achievements are granted to graduates and

name has no official or political significance; it is a geographical expression merely. The whole region lies between Ethiopia and the Sudan in the N., the Belgian Congo and Belgian trust ter. of Ruanda Urundi to the W., and N. Rhodesia, Nyasaland, and Mozambique in the S., being bounded on the E. by Somalia (formerly It. Somaliland) and the Indian Ocean.

Although the E. African coast has been known to merchants for cents. the interior was until comparatively recent times known only to Arab traders, who penetrated to Lake Victoria and beyond in search of ivory and slaves. The first Europeans to explore the hinterland were the Ger. missionaries Ludwig Krapf and Johannes Rebmann; their discoveries revived interest in the search for the source of the Nile and inspired the journeys of J. H. Speke, Sir Richard Burton, James Grant, and Samuel White Baker

(qq.v.). Later David Livingstone (q.v.), already famous for his Central African travels, turned his attention to E. Africa. He and the other missionaries and explorers that followed him concentrated their attention on what is now Uganda, for only there did they find organised and comparatively advanced peoples and some immediate prospects of commerce. Elsewhere the tribes were extremely primitive—they did not, for example, understand the principle of the wheel—and they were moreover oppressed by savage inter-tribal wars and by the operations of Arab slave-raiders. It was the desire to liberate E. Africa from the slave-trade and to substitute for it peaceful commerce and the elements of civilisation that took the Brit. into E. Africa; though it was Germany that first, in 1885, declared a protectorate in the area, over what is now Tanganyika.

At that time the whole of the interior was claimed by the Sultan of Zanzibar, and the Ger. action raised the question of the extent of his dominions. An international commission ruled in 1886 that they were limited to the is. of Zanzibar, Pemba, and Mafia and a 10-m. wide strip of the coastland from Tungi Bay to Kipini. The interior was thereupon divided into Ger. and Brit. spheres of influence, the Brit. lying N. of a line from the mouth of the R. Umbo by Lake Jipe and the N. base of Mount Kilimanjaro to Lake Victoria. The line was later extended W. so as to place Uganda within the Brit. sphere. Zanzibar itself became a Brit. protectorate in 1890.

The administration and opening up to trade of B. E. A. was at first left to a commercial company, the B. E. A. Association, later incorporated under a Royal Charter as the Imperial B. E. A. Co. In 1895 Her Majesty's Gov. declared a protectorate over Uganda and the area to the E. of it, now called Kenya but then the E. African Protectorate. The frontiers have been modified sev. times since, the last time being when the prov. of Jubaland was detached from Kenya and ceded to Italy in 1925.

In 1905 the protectorates were transferred from the authority of the Foreign Office to that of the Colonial Office. By the Kenya Annexation Order in Council of 1920 that part of the E. African Protectorate outside the mainland dominions of the Sultan of Zanzibar was recognised as a colony, the remainder being still a protectorate but the whole being administered by the same Governor and Executive and Legislative Councils. The Sultan's domains in Tanganyika had been bought outright by the Germans. After the First World War, in which there was fighting between Ger. and Brit. forces in E. Africa, Tanganyika was handed over to Brit. administration under a League of Nations mandate, and Britain now administers it as a U.N. trust ter.

Closer union between Kenya, Uganda, and Tanganyika has often been advocated on both political and economic grounds, but the difference in status between the 3 ters. presents a difficulty, and there

is strong opposition to any proposals for union or federation especially from the traditional native rulers of Uganda—which, unlike Kenya and Tanganyika, has never been opened up to European settlement on any large scale. Machinery for dealing with certain affairs regionally has existed since the foundation of the Governors' Conference in 1926. The functions of the Governors' Conference grew in importance with the outbreak of war in 1939, and at the end of the war there was a general desire to consolidate the arrangements made for regional action through the permanent secretariat of the Conference. Finally an Order in Council of Dec. 1947 set up the E. Africa High Commission (q.v.) to deal with a large range of common services.

British Electricity Authority, evolved from the Central Electricity Board (1927–1918). After the nationalisation of the electricity industry by the passing of the Electricity Act, 1947, the B. E. A. was made responsible (as from 1 April 1948) to the Minister of Fuel and Power for the generation of electric current and for its sale to 14 area boards, which replaced the supply undertakings throughout England and Wales, and S. Scotland. Subsequently the Electricity Reorganisation Act, 1954, changed the title of the B. E. A. to Central Electricity Authority (q.v.) and a S. of Scotland Electricity Board took over the duties of generation in S. Scotland as well as the distribution duties of 2 area boards. In N. Scotland the generation and sale of electricity is the responsibility of the N. of Scotland Hydro-electric Board.

British Empire, term roughly synonymous with Brit. Commonwealth of Nations. The expression 'Brit. Commonwealth and Empire' is now frequently used, and in this usage 'Commonwealth' is taken to mean the self-governing Commonwealth countries and 'Empire' their dependencies. See **BRITISH COMMONWEALTH AND EMPIRE**.

British Expeditionary Force (B.E.F.). For operations abroad, the organization of the Brit. Army in 1914 provided for an expeditionary force of 6 divs. of infantry, each consisting of 598 officers and 18,077 men; with 54 field guns, 18 4.5 howitzers, and 4 heavy 60-pounder guns; and 1 div. of cavalry, consisting of 485 officers and 9412 men, with 24 horse artillery guns. In addition were auxiliary troops comprising engineers, signallers, and men of the Royal Flying Corps, besides troops for the line of communications. The famous B.E.F. which went out to France at the outbreak of the First World War numbered about 150,000 men. Only 4 infantry divs. with 1 cavalry div. were disembarked in Aug. 1914, the remaining 2 infantry divs., together with a second cavalry div., only reaching the W. front in mid Sept. The force was under the command of Gen. Sir John French, and its component corps under Sir Douglas Haig and Sir Horace Smith Dorrien, the 1st Cavalry Div. being commanded by Sir Edmund Allenby. The force was steadily augmented from the autumn of

1914 until by April 1915 it numbered some 750,000 men exclusive of colonial troops.

In the Second World War the B.E.F., commanded by Lord Gort, landed in France in Sept. 1939, and was finally evacuated from Dunkirk on 3 June 1940. By 21 Sept. the B.E.F. only consisted of 4 divs., and the 51st Fr. Div. was accordingly included in the Brit. command. The 1st Corps, consisting of the 1st and 2nd Divs., moved to the Belgian frontier, a distance of 250 m. from its assembly area, on 3 Oct.; the 2nd Corps, consisting of the 3rd and 4th Divs., began to arrive from Le Mans on 3 Oct. The commander of the 3rd Div. was Major-Gen. B. L. Montgomery (afterwards Field-Marshal Lord Montgomery). Major-Gen. H. R. L. G. Alexander (afterwards Field-Marshal Lord Alexander) commanded the 1st Div. The other 2 commanders were Maj.-Gen. H. C. Loyd (2nd Div.) and Maj.-Gen. G. C. Johnson, V.C. (4th Div.). At the time of the Dunkirk evacuation the B.E.F. numbered 250,000. In all 211,532 ft men and 13,053 casualties were embarked at Dunkirk (in addition to 112,546 allied troops, mostly French). See WESTERN FRONT IN SECOND WORLD WAR.

British Film Institute, see FILM INSTITUTE.

British Guiana, Brit. crown colony in S. America situated between the Orinoco and the Amazon. It is bounded by the Atlantic on the N., Surinam (Dutch Guiana) on the E., where the R. Corentyne separates them; by Brazil on the S. and SW.; and by Venezuela on the W. The country has an area of approximately 83,000 sq. m., but definite boundaries have only recently been settled on all sides. The seaboard is roughly 270 m. long. Only about 200 sq. m. along the coast and up the rvs. are cultivated. The colony was first partly settled between 1616 and 1621 by the Dutch W. India Co., who erected a fort at Kyk-over-al in the present country of Essequibo, and in 1624 a Flushing merchant, named Van Peere, made a settlement on the Berbice R. The first Eng. attempt at settlement was made by Capt. Leigh on the O'apock R. (now in Fr. Guiana) in 1604. The effort was followed by Robert Harcourt in 1613 and 1627, but his settlement was not permanent. Lord Willoughby, well known in the early hist. of Barbados, founded a settlement in Surinam in 1663, which was captured by the Dutch in 1667 and ceded to them at the Peace of Breda in exchange for New York. The Dutch kept their hold over the country with varying degrees of firmness, now yielding to France, now to England or Portugal, until 1796, when during the war of the Fr. Revolution, it was captured by a Brit. fleet sailing from Barbados. The ter. was restored to the Dutch in 1802, but was retaken by Great Britain in the following year, and finally ceded to her in 1814. In all Brit., Fr., and Dutch Guiana the physical characteristics are almost identical. On the Atlantic coast are alluvial deposits generally below sea level, and suffering

heavy rains which convert them into mud swamps. Sandbanks jut out to the ocean, of which some are shifting, some fixed through the roots of mangrove-trees. The alluvial areas extend for from 10 to 40 m. inland; the area beyond is formed chiefly of detritus caused by the passing of the earlier mt masses. The central area is a plateau of 3000 or 3500 ft. This is covered with a dense forest containing a wealth of timber. The colony is well watered by streams which enter the Atlantic. The large quantities of sediment brought down to their mouths and the rapids and other obstacles to navigation further upstream effectually hinder any commercial value they might have, though their use in irrigation is unquestionable, and sev. large-scale water control schemes have been planned. Small vessels can navigate them as far as the first rapids. This length of navigation varies in different cases between 10 and 150 m. The climate is hot and moist and uniform. During the larger part of the year the heat, averaging 80° F., is lessened by sea breezes. The rainfall is heavy and averages 90 in. annually. Naturally the flora of the dist. is luxuriant and abnormal. The vast numbers of trees contain woods suitable for shipbuilding (notably greenheart, found only in B. G., and mora), house-building, roofing, and cabinet-making; and the various products other than timber are balata, bark, resin, balsam, wax, fibre, oil, nuts. Food plants abound, as the sweet potato, arrowroot, tomato, guava, cherry, avocado, breadfruit, melon, banana, pineapple, yam, rice, and maize. Hundreds of species of creeper are found in great plenty. Among animal life the birds present the most striking features; vultures, eagles, owls, nightjars, humming-birds, bell-birds, trogons, puff-birds, parrots, kingfishers, trumpeters, herons, and divers are included. Not so prolific as one would imagine from the wildness of the country are the animals, though specimens of jaguar, tiger-cat, peccary, tapir, sloth, armadillo, ant-eater, agouti, opossum, raccoon, porcupine, monkey, alligator, and manatee abound. The native Indians lead a natural life in the woods. The W. part of B. G. contains the Parima Mts, the N. has the Imataca range, while the Acari Mts form the S. boundary. Mt Roraima (8740 ft) is the highest peak. Among the important rvs. are Corentyne, Berbice, Demerara, Essequibo, and Cuyuni. On the Potaro R., a trib. of the Essequibo R., are the famous Kaieteur Falls, which have a clear drop of 741 ft, and a total fall of 822 ft, or nearly 5 times as high as Niagara.

Over a third of the cultivable area is devoted to the growing of sugarcane; rice is the crop that comes next in importance, and coco-nuts, coffee, cocoa, and limes are also cultivated. Sugar is the colony's prin. export; shipments of sugar and molasses in 1955 were worth £8,500,000. Guiana is very rich in minerals, especially gold, the output of which in 1955 was valued at £170,000. The output of diamonds in 1955 was worth £280,000. Bauxite, the ore of aluminium, is present

in large quantities, the output in 1955 being 2,435,282 tons; exports were worth \$5,000,000. Manganese, iron, and mica have also been found. Apart from the products mentioned, B. G. exports rum molasses, balata, and timber. The colony is divided into 3 provs., Berbice, Demerara, and Essequibo. The ports are Georgetown (pop. 110,000), the cap (largely destroyed by a fire 23 Feb. 1945), and New Amsterdam (pop. 9500). Before 1928 the constitution of the colony consisted of the court of policy and combined court, but as a result of the recommendations of the Wilson-Snell commission (appointed 1926), an Order in Council was passed which (as amended in 1935) provided for the estab. of a legislative council in place of the court of policy and combined court which had existed since 1831. The constitution was amended in 1943 and again in 1953, and then provided for universal adult suffrage, a 2-chamber legislature, and a ministerial system. The 1953 constitution had to be suspended after 6 months' operation to prevent Communist subversion of the gov. and a danger crisis in public order and economic affairs. A nominated legislative council took office in 1954, and some of its members were appointed ministers. In 1957 elections were reintroduced for 14 of the 24 seats in the legislative council. An airfield built by the U.S. forces during the war, 25 m. up the Demerara R., is now used as a civil airport. There are 80 m. of single-track railway; otherwise communication is maintained by riv. traffic (350 m.), by canal (39 m.), by motor roads (365 m.), by trails (about 200 m.), and by air. There are telephone and telegraph lines, and Georgetown wireless station is connected with 5 stations in the interior. A White Paper detailing a \$20 million 5-year development scheme came out in July 1956. The estimated pop. on 30 June 1955 was 485,000; comprising E. Indians: 223,000; Africans: 172,000; Coloured: 53,000; Europeans: 13,000; Chinese: 4000; Amerindians: 20,000. Aboriginal Indians are occupied chiefly in hunting, fishing, and cassava growing. See W. Beebe, C. I. Hartly, and P. G. Howes, *Typical Wild Life in British Guiana*, 1917; O. Richardson, *On the Diamond Trail in British Guiana*, 1925; E. Waugh, *Ninety-two Days*, 1934; Sir C. Clement, *A Constitutional History of British Guiana*, 1937; M. Swan, *British Guiana*, 1957.

British Gum, see DEXTRENE.

British Honduras, known also as Belize, Brit. crown colony in Central America. It is bounded on the E. by the Bay of Honduras, in the Caribbean Sea, and borders in other directions upon Mexico and Guatemala. The peninsula Yucatan lies to the N. Its area is 8866 sq. m., and its pop. in 1955 was estimated at 79,000. The centre of the country is crossed by the R. Belize, while on the NW. and S. respectively are the Rs. Hondo and Sarstoon, forming natural boundaries. The highest part of the land is 4000 ft above sea level in the Cockscorn Mts. Along the coast the soil is low and marshy;

for 10 to 20 m. inland it remains flat, and then rises in a series of hills 500–4000 ft high. Nearly half the land is covered in primeval forest; elsewhere is savannah land and open plains, covered with wiry grass and scattered pine-trees—good ground for cattle-rearing. About 180,000 to 200,000 ac. of land are under cultivation, the chief crops being sugar and maize. A great number of fruits are also grown, including bananas, plantains, citrus fruits, coco-nuts, and pineapples. The forests, however, are the most valuable possession of B. H., and mahogany, pine, and cedar are the staple products. Though B. H. lies in the tropics, the climate has, with some justification, been described as sub-tropical. The range of temp. is small, and for many months in the year there is always a strong sea breeze. Visitors are usually agreeably surprised at the coolness of the climate, even during the summer months. The colony's reputation of being unhealthy is probably a legacy of the days when yellow fever was common throughout Central America. While the colony is not exceptionally healthy, it is certainly by no means a hot-bed of deadly diseases. There was an outbreak of yellow fever in 1904 and again in 1921, and since then the proper measures of control have been enforced. Malaria is prevalent, but the very serious types of the disease are not common in the colony. In anti-malarial work B. H. has taken a prominent place. Dysentery is not at all common here and typhoid is very rare. Means of communication are poor, though roads connect the prin. tns, which also have telephone and telegraph facilities. There is wireless communication with Jamaica and New Orleans. There is an airfield at Stanley Field (10 m. W. of Belize). The country first became known to Englishmen about 1638, but it is thought that Columbus discovered the coast in 1502 when on his way from Cuba to find a passage to the Indies. It is probable that settlers from Jamaica visited the country and, finding logwood available, estab. themselves in what is now B. H. Very soon they came in contact with the Spaniards and Indians of Yucatan and there are records of many conflicts. The Spaniards made repeated attempts to expel the Englishmen and their slaves, but in 1670 Spain ceded in perpetuity all lands in the W. Indies and in America held by the English at the time. In 1717 the Spaniards made a determined effort to reconquer the settlement, and again in 1754 and 1779. Even after the treaty of London, 1766, by which Great Britain gave up the Mosquito Coast for the settlement, Spain renewed her attacks, this time from Mexico, but he was finally defeated in 1789 on 10 Sept. at St George's Bay. The first settlers, from 1638 to 1786, managed their own affairs, electing magistrates at public meetings who discharged all executive and judicial functions. In 1765 the king gave a constitution to the people founded on the met. customs. An executive council was first appointed in 1840 and, in 1853, a

legislative assembly was formally constituted, but in 1870 this latter body was replaced by a legislative council, with a lieutenant-governor subordinate to the Governor of Jamaica (first appointed in 1862) as president. Independence of Jamaica came in 1884 with the appointment of a governor and commander-in-chief. To-day the legislature comprises a legislative assembly in which elected members are in the majority. The executive council, the chief instrument of policy, is composed of the governor as chairman, 3 *ex officio* members, and 6 members of the assembly, including not fewer than 2 nominated members. Certain unofficial members of the executive council have been appointed to the oversight of particular departments as a step towards a ministerial system. The cap. is Belize, or Balize (pop. 27,000), a centre of the trade of Central America. Orange Walk, San Antonio, Corozal, El Cayo, Stann Creek, and Punta Gorda are other towns of some importance. There is a dispute of long standing with Guatemala over the ownership of B. H. After negotiations beginning in 1857, a boundary agreement with Guatemala over the question was finally reached, on the basis of actual Brit. occupation and embodied in a treaty or convention signed at Guatemala city on 30 April 1859. Joint commissioners were appointed in 1860 to settle the position of the terminal parts of the S. section of the boundary, but the whole matter fell through over the Guatemalan claim that the requirements of Clause 7 of the convention, concerning the alleged obligation on Britain to build a road between Belize and Guatemala city, had not been fulfilled. In 1929 joint commissioners were again appointed, but only to lead to a renewed claim by Guatemala over the implementation of Clause 7. Guatemala professed to be especially anxious concerning smuggling, which they contended would be more easily controlled were the Brit. Gov. to construct a road or combine waterways with a new roadway from Belize. Guatemala then invited Great Britain to 'return to her the entire ter. of B. H. for £400,000 in settlement of all Guatemala's claims for fulfilment of the treaty of 1859, or, alternatively, that Great Britain should pay to Guatemala £400,000 and grant a strip of land at a specified point necessary to give the dept. of Petén an outlet to the sea, or, alternatively, Guatemala would forgo all claims for non-fulfilment of the treaty and Great Britain should pay \$50,000 with interest as from 1859, etc. Naturally none of these proposals was acceptable to Great Britain, and on 21 July 1937 Guatemala proposed that the matter be submitted to the arbitration of the Amer. president, a proposal which the Brit. foreign secretary accepted, with the substitution of the permanent court of international justice as arbiter—a proposal from which Guatemala shrank. Later, on 15 June 1940, President Ubico of Guatemala announced that 'efforts to incorporate B. H. with Guatemala would be suspended.' In Feb. 1948,

urged on probably by ill-founded if well-advertised 'claims' by the Argentine and Chilean Govs. to Deception Is. and other ter. belonging to the Brit. Falkland Is. Dependencies, and indeed to the Falkland Is. as a whole, Guatemala took the opportunity of preparing a coup against Brit. Honduras. The Brit. Gov. promptly sent the cruiser *Sheffield* to Belize, because of reports that irresponsible elements from Guatemala might try to invade the colony. The Brit. cruiser *Devonshire* sailed to Belize (28 Feb.) from Jamaica, carrying a number of troops of the Glos. Regiment to protect Brit. lives and property against harm by Guatemalan bands. *Consult G. Ireland, Boundaries, Possessions, and Conflicts in Central and North America and the Caribbean*, 1941.

Like other parts of Central America, B. H. is rich in archaeological remains, but they have been as yet but little investigated. Ruins of *tus*, pyramids, and temples of the early Maya period have been located in various parts of the colony; in ruins near Corozal, in the N., wonderful painted stucco-work was found; in the S. at Lubantán, megalithic terraces, mounds, and pyramids were discovered. In 1926-7 excavation was started at Lubantán by an expedition sent by the Brit. Museum. Among the structures of the Maya *tn*, which was, apparently, abandoned for some unknown reason long before the coming of the Spaniards, were found various interesting objects—bowls, vases, figurines, and masks of pottery, spear-heads and blades of stone, jadeite beads, and limestone pendants. The following year excavations were started at a site near Pusilha, and here, in a plaza surrounded by 6 flat-topped pyramids, were found fragments of 20 inscribed stelae. Six hundred eccentrically shaped flints and obsidian knives were also found. In the neighbourhood the remains of a bridge have been discovered—the only bridge known to exist near a Maya site (see MAYAS). See A. R. Gibbs, *British Honduras: an Historical and Descriptive Account of the Colony from its Settlement, 1670*, 1883; W. A. Morris, *The Colony of British Honduras, its Resources and Prospects*, 1883; M. S. Metzgen and H. E. C. Cain, *The Handbook of British Honduras*, 1925 (pub. by W. India Committee); T. Gann, *Mystery Cities*, 1925, and *Ancient Cities and Modern Tribes*, 1926; Sir J. A. Burdon, *Archives of British Honduras* (3 vols.), 1931-5; G. W. Dodds, *Report on Belize Harbour and some of the Rivers of British Honduras* (Belize Gov. Printing Office), 1936; J. E. Thompson, *Excavations at San José, British Honduras*, Washington, 1939; I. T. Sanderson, *Living Treasure*, New York, 1941; A. H. Anderson, *Brief Sketch of British Honduras*, Belize, 1927, 1944; S. L. Calger, *British Honduras, Past and Present*, 1951.

British India Steam Navigation Company was started in 1856, under the name of the Calcutta and Burmah Steam Navigation Co., for the purpose of conducting trade along the coast of India. During the Indian mutiny, 1857, it did great

service to the Brit. Gov. by conveying troops from Ceylon to Calcutta, and again offered its services in 1867 during the Abyssinian campaign. Its present name was adopted in 1862. Trade with the E. received a great impetus in 1869 with the opening of the Suez Canal. The S.S. *India* of this line was the first steamer to arrive in London from India via the canal. The trade of this company became very extensive, and normally its vessels visit the ports of India, Burma, the Straits Settlements, the Philippines, the Dutch E. Indies, Queensland, and, since 1872, the E. coast of Africa. The company and the P. & O. joined interests in 1914, and are the 2 predominant partners in the Inchcape group of Brit. shipping. Though possessing no vessels of outstanding size, a total tonnage of more than 400,000 places the company among the largest steamship owners in the world. The words 'Steam Navigation' in its title are becoming a misnomer, for the line has over 20,000 tons of motor ships. Brit. India vessels have a black funnel with 2 white bands.

British Industries Fair, ann. fair to promote Brit. trade and act as a shop window for Brit.-made goods. The first fair was held under official sponsorship in London in 1915, and showed that foreign goods then in short supply might be obtained from the empire; an additional section was opened at Birmingham in 1920. In 1945 the organisation of the London section of the B.I.F. was taken over by the Board of Trade when it absorbed the dept. of overseas trade, the original organiser. In 1954 responsibility for the London section was transferred to a private company, which ran the 1955 and 1956 fairs; after the 1956 fair the London section closed and the B.I.F. is carried on at Birmingham only where it has been organised by the Birmingham Chamber of Commerce since its inception. The Birmingham section is devoted to consumer goods, hardware, machinery, electricity, building, and kindred industries.

British Isles, archipelago off the NW. coast of the continent of Europe, from which it is divided by the N. Sea, the straits of Dover, and the Eng. Channel. It comprises Great Britain, made up of England, Scotland, and Wales; Ireland; the Orkney and Shetland Is., to the N. of Scotland; the Isle of Man, in the Irish Sea; the Scilly Is., off the coast of Cornwall; and the Isle of Wight and the Channel Is., in the Eng. Channel (q.v.). Total area is about 121,600 sq. m. The Isle of Man and the Channel Is. enjoy considerable administrative autonomy. Politically only N. Ireland is included in the term since the treaty with S. Ireland (1921), and in official use it has been superseded by 'Great Britain and N. Ireland.'

British Israelites, religious sect which claims that the Brit.-Amer. peoples are the 10 lost tribes of Israel, that the Brit. monarchy is directly descended from David, and that by a literal fulfilment of biblical prophecy these peoples are to rule the

world in preparation for the Millennium.

Modern Substitutes for Christianity, 1942.

British Legion, association of Brit. men and women who took part in the 2 world wars. It was founded in 1921, and formed by an amalgamation of 4 'ex-service' societies. These were the Comrades of the Great War, the National Association of Discharged Sailors and Soldiers (the 'Silver Badge' men), the National Federation of Discharged and Demobilised Sailors and Soldiers, and the Officers Association. These bodies united to form one national organisation under the leadership of Field-Marshal Earl Haig (q.v.), its first president. A royal charter of incorporation was received in April 1925. The legion is non-political and non-sectarian and open to all Brit. (or naturalised) men and women who served in the Crown forces, Red Cross, and similar associations during the wars. Its aim is generally to watch over the welfare of ex-service men and women and to secure legislation for their benefit. Through an employment bureau it seeks to find them employment. It furnishes legal and financial aid; assists the distressed ex-service man's family; cares for him, if tubercular, at an industrial vil. settlement; sees that he gets his pension; and in certain cases advances housing loans and small business loans. Its chief source of revenue is through the sale of 'Flanders Poppies,' which it manufactures in its poppy factory, and which the public buy each year on Poppy Day. The legion has branches at home and abroad; its H.Q. are in Pall Mall, London, S.W.1. Its motto is 'Service not self.'

British Medical Association, founded in 1832 as Provincial Medical and Surgical Association; it took its present name in 1856. Its objects are to promote the medical and allied sciences and to maintain the honour and interests of the medical profession. Its membership is upwards of 71,000 and it is recognised by the gov. and others as the representative body of the profession in Britain. Its H.Q. are at Tavistock Square, London, W.C.1, and there are also a number of branches and divs. at home and in the Commonwealth. Its policy is determined by representatives from its divs. and its executive is its Council. Its official organ is the *British Medical Journal* (weekly); it also publishes 14 specialist journals, and *Family Doctor*, a monthly magazine for the general public. Papers dealing with every branch of medical science are read at the ann. meeting, which is held at a different place each year (1957, Newcastle upon Tyne). The library of the association contains 70,000 vols. and 1650 current periodicals.

'**British Medical Journal**' is the official organ of the Brit. Medical Association. It is a contemporary and trustworthy record of the progress being made in every branch of medical science, and includes reports of all congresses, conferences, meetings of medical societies, etc., of

interest to members of the medical profession. It was started in 1840 as the *Provincial Medical and Surgical Journal*, became the *Association Medical Journal* in 1853, and received its present name in 1857. It is pub. weekly from the association's office, Brit. Medical Association House, Tavistock Square, London, W.C.1.

British Motor Corporation, the largest Brit. motor-car manufacturing concern, formed in 1952 by the merging of Austin Motor Co. and Morris Motors, including the Wolseley and Riley companies. The present production target (1956) is 12,500 cars per week. See AUSTIN, HERBERT.

British Museum, London, originated with the grant of £20,000 voted by Parliament in 1753 for the purchase of Sir Hans Sloane's collection of rare books, MSS., curiosities, and works of art, which had cost him £50,000. Montague House was bought for £10,250 as a place for their reception. To the Sloane collection were added the Harleyan and Cottonian libraries, the former having belonged to Robert and Edward Harley, 1st and 2nd Earls of Oxford, and the latter to Sir Robert Cotton, whose grandson bequeathed it to the nation in 1700. In 1757 George II added to this collection the books collected by the kings and queens of England from the time of Henry VII, including the libraries of Crammer and Casaubon. In 1759 Montague House was formally opened as the B. M. Gifts, bequests, and purchases followed; in 1772 Parliament voted £8400 for the purchase of Sir Wm Hamilton's collection of vases, antiquities, and drawings; in 1799 the Rev. Clayton Mordaunt Cracherode bequeathed his library of books and prints; George III made a gift to the nation of the Egyptian marbles taken from Alexandria; and between 1805 and 1818 the State bought the Townley marbles, the Lansdowne MSS., the Phigalian marbles, the Elgin marbles, and the Burney library. The accommodation in Montague House was no longer sufficient, and preparations for a new building were placed, in 1823, in the hands of Sir Robert Smirke. A new building on the old site, the present B. M., was completed in 1847, facing S. on to Great Russell Street, the E. and W. wings being joined by a facade of columns, 37 ft in height, after the Ionic order. To the E. and W. are residences for the most important officers of the museum. King George III's library, presented by George IV in 1823, occupies the E. wing. Antonio Panizzi (q.v.), keeper of the dept of printed books, procured for the museum the bequest of the Grenville library, belonging to the 1st Hon. Thomas Grenville, of 20,240 vols., which had cost about £54,000. Increasing numbers of books and readers made it necessary to build a new reading-room; a grant for this was voted by Parliament in 1854, and the erection of the present circular reading-room, with its surrounding book-stacks, designed by Panizzi, was carried out under the direction of Sydney Smirke, and completed and opened in 1857. Alterations to the shelving have provided some 75 m. for the accommodation of books.

There are about 20,000 vols. in the reading-room to which the readers have free access; the total number of vols. now in the library is about 5,000,000. The B. M. is entitled to receive 1 free copy of every work pub. in the U.K. (see COPYRIGHT LIBRARIES).

The great increases in the B. M. collections during the last half of the 18th and first half of the 19th cents. made it necessary to move part of its wealth of material to a new home, and at the close of the Great International Exhibition of 1862 part of the site in S. Kensington was acquired for building a museum to house the natural hist. collections. This new building, commonly called the Natural Hist. Museum, was opened to the public in 1881. The Natural Hist. Museum's main function is scientific, i.e. to study, identify, and classify all objects of natural hist. so that they may be available for reference. Thus it is able to do because its collections are among the most complete and important in the world, both in size and for the rarities they contain. The second function, an educational one, is to make available the results of its scientific work, by exhibits in the public galleries, by lectures, and by the issue of general handbooks, and also monographs, bulletins, and catalogues for the use of the specialist. Its library contains perhaps the finest collection in the world on natural hist. subjects. The museum includes the 5 depts of zoology, entomology, palaeontology, mineralogy, and botany. Among the more noteworthy exhibits are the life-sized model of a Blue Whale, 91 ft long and the largest known kind of animal of all time. At the other end of the scale are viruses, minute forms of life intermediate between plants and animals and the cause of many diseases of human beings, plants and animals, from colds to foot and mouth disease. A fine collection of fossils and casts of dinosaurs and also of swimming and flying reptiles is to be seen in the dept of palaeontology. One of the rarest fossils is that of the earliest known bird, *Archaeopteryx*, which lived in the Jurassic period some 120 million years ago.

A bequest by Wm White (d. 1823) enabled a start to be made on a new wing at Bloomsbury (1879), jutting out from the S.E. angle. This wing was opened in 1882, and contains part of the depts of MSS. and oriental printed books and MSS. The latest addition to the museum was begun during the chancellorship of Sir Wm Harcourt (1892-4), when the ground at the back of the museum was bought from the Duke of Bedford. A handsome new suite of galleries, known as the King Edward VII galleries, was opened in 1914. The B. M. also has a building at Colindale, near Hendon, where newspapers are stored. The B. M. is divided into 11 different depts, classified as follows: I, printed books; II, MSS.; III, oriental printed books and MSS.; IV, prints and drawings; V, coins and medals; VI, Egyptian antiquities; VII, W. Asiatic antiquities; VIII, Gk and Rom. antiquities; IX, Brit. and medieval

antiquities; X, oriental antiquities; XI, ethnography; and the research laboratory.

I, II and III: Among the museum's many important possessions may be noted the great number of illuminated MSS., early documents of special interest, autographs of famous men and women permanently exhibited in show-cases, and the vast library of printed books described above. The Lindisfarne Gospels, 3 original copies of Magna Carta, the earliest known copies of the *Odyssey* and the *Iliad*, the *Codex Alexandrinus* (a MS. of the Bible written in uncial Greek before the end of the 5th cent.), the *Codex Sinaiticus* (q.v.) acquired in 1933, and the Luttrell Psalter (c. 1340) are noteworthy among countless other priceless MSS. of equal interest.

IV: There is a unique collection of prints and drawings of all W. schools, which includes examples of the work of Raphael, Michaelangelo, Leonardo da Vinci, Rembrandt, Hogarth, and many others.

V: The collection of coins and medals, tokens, and paper money is representative of all countries and periods.

VI and VII: Near E. antiquities include the Egyptian monuments (2000 BC to AD 640), the Rosetta Stone which affords the key to hieroglyphics, and the Assyrian collection which includes sculptures excavated at Nimrud from the palace of Assur-nasir-pal (885-860 BC), at Khorsabad, Koyunjik and elsewhere by Layard, Rassam, Loftus, Sir H. C. Rawlinson, and Sir Leonard Woolley.

VIII: In the dept of Gk and Rom. antiquities are the beautiful Elgin marbles (q.v.), the sculptures of the Mausoleum at Halicarnassus (excavated 1857), sculptural remains from the ant. cities in Lycia (obtained by Sir C. Fellows, 1842-6), and some of the finest pieces of statuary representative of Gk and Rom. art to be found in the world. There is also a fine collection of antique vases, bronzes, gems, gold ornaments, etc.

IX: The dept of Brit. and medieval antiquities houses the gifts of A. W. Franks. The displays provide a record of life in Britain from the Stone Age to the medieval period and include the remarkable finds from Sutton Hoo excavated in 1939 and presented to the nation by their owner.

X: The oriental collection includes antiquities and works of art, including prints and drawings, from China, Japan, India, Indonesia, and central Asia from the neolithic period onwards, and of W. Asia and N. Africa from the beginning of the Islamic period.

XI: The dept of ethnography houses ethnographical and archaeological material from Africa, Australasia (including Oceania) and America (including its ant. civilisations), and from the more primitive peoples of Asia.

The research laboratory conducts scientific research into library and museum material, investigates methods of cleaning and repairing, and prepares the products of archaeological excavations for incorporation in the collections.

The B. M. is governed by a standing committee, the 3 prin. trustees of which

are *ex officio* the Archbishop of Canterbury, the lord high chancellor, and the speaker of the House of Commons. Administrative expenses are met by a vote under the Civil Estimates. A certain amount of damage was sustained by the B. M. during the Second World War, including the destruction of some 150,000 books at Bloomsbury, and some 30,000 vols. of bound newspapers at Colindale. Damage to the collections was, however, comparatively slight, since many objects had been moved to safer quarters.

British Music. The cultivation of music in Great Britain remained constant throughout hist. on the executive side, but fluctuated unsteadily in composition. When John Dunstable, who had won fame in sev. foreign countries, d. in 1453, his only equals among musicians of his own age were the Flemings Binchois and Dufay. All through the 15th cent. many Brit. composers appeared who, if they did not quite reach his eminence, held their own against their continental contemporaries, notably Fayrfax, Cornyshe, and Lionel Power. Early polyphony, serving mainly the church, had seen no such flowering except in France and the Netherlands. This was the first of the 3 peak periods of composition in Britain.

To the second period, that of the great Tudor school, Taverner and Tye formed an immediate link. The 16th cent., still doing great service to the church, also saw a secularisation of music in virginal and lute pieces, songs to the lute and music for consorts of viols. The fantasy (or fancy) (q.v.) for strings developed as something like an Eng. speciality, and one phenomenon of it, the *In Nomine* (q.v.), certainly did. This is the only purely Eng. invention in composition, with one more modest exception upon which we shall come presently. But the greatest contribution to the 16th cent., down to and a little beyond the death of Elizabeth I. is undoubtedly the Eng. madrigal, in which nearly all the finest and all the most delightful composers exercised themselves with a skill and grace equalling that of the contemporary poets (see MADRIGAL and under the composers' names there mentioned). Among the lutenists must be singled out John Dowland, one of the greatest song-writers of any age, and Campion, who was his own poet. Church music, even during the difficult Reformation period, continued to be served with great polyphonic works by such masters as Tallis, Byrd, Shepherd, Robert White, and Orlando Gibbons. A master of the string fantasy, John Cooper, who Italianised his name as Coperario, showed a certain dependence of Eng. on It. instrumental music, but the balance was redressed by Alfonso Ferrabosco the younger, of It. descent but b. in England, who is as much an Eng. composer as Handel was to be later. On the other hand John Bull and Peter Phillips went to live in the Netherlands and became to all intents and purposes Flemings. Nevertheless Bull is among the Eng. masters of the virginal, cultivating the then typically Eng. form of variations.

The decline that came in the 18th cent. would have set in during the 17th had it not been for the dominating figure of Purcell, who did more than anyone else to bring an extraordinary change into the musical atmosphere, not unlike that from the Tudor to the baroque style in sculpture. There are other names that carry weight: Henry Lawes, who did much for the natural setting of Eng. words; Matthew Locke, who in his dramatic works made an approach towards full-scale opera; Henry Aldrich, architect as well as musician; John Blow, who wrote both church and dramatic music, and anticipated Purcell's ceremonial odes (another almost purely Eng. type); but the only composers *b. after Purcell* who came anywhere near him were John Eccles and Jeremiah Clarke. In sum, Purcell alone still makes Eng. 17th-cent. music universally important.

The 18th-cent. picture becomes crowded with composers, but shows no Brit. figure of outstanding greatness. Eng. music was at that time entirely enthralled by a foreign-born genius, Handel, who owes at least as much to his Eng. environment as music in Britain does to him. If composition declined, the cultivation of music, particularly in London, was more intense than ever, and became more lively and many-sided through an unlimited importation of foreign performers as well as composers. Opera flourished on a grand scale in Italy and more modestly in England as ballad opera (plays with songs) which would be another typically Eng. musical phenomenon if its music were original instead of borrowed from folk and popular song. Public concerts became fashionable. The most considerable Eng. composers in the 18th cent. are those born earliest in its course, Thomas Augustine Arne, and Boyce. Then comes a gradual descent. Thomas Linley wrote much pleasant theatre music and Charles Dibdin had a fine, robust vein of melody. James Hook and Wm Shield also were successful on the stage, and Stephen Storace could write very passable operas. Both he and Attwood had known Mozart in Vienna and learnt something from him. Three other composers, born almost too late in the cent. to belong properly to it as artists, represent that purely Eng. type of composition mentioned above—the glee (q.v.): namely Calcott, Webbe, and Crotch. But it was the elder Webbe who had developed the glee out of the earlier catch (q.v.), so that it may be said to belong to the 18th cent., though it was more assiduously cultivated in the 19th.

The 19th cent. began much as the 18th had finished, with foreign musicians as much in the ascendant as ever. But its early years saw the rise to maturity of one Brit. composer, the Irishman John Field who was a great pianist and important to the development of composition for his instrument, or his style influenced that of Chopin and others, and he anticipated Chopin by writing nocturnes. Field lived for many years in Russia, and another Irishman, Balfe, had some success there, as well as in Paris, with his operas; Balfe's

work was popular as was that of his compatriot Vincent Wallace, who had similar gifts. The next composer of some note was Sterndale Bennett, *b. 1816*, and then none appeared until the birth of Sullivan in 1842. Bennett won the admiration of Mendelssohn and Schumann at Leipzig, where Sullivan also studied later. The latter took himself very seriously as a composer and aimed at success with oratorios and symphonic music, only to find it in operetta, where indeed he is pre-eminent, if not in dash and comic spirit, certainly in variety of resource and elegance of craftsmanship. (Goring Thomas took his operas more seriously, but although they have musical quality, they lack dramatic life. The time for Brit. opera to flourish was not yet. Parry, who despised it, was in any case not suited to it with his placidly fluent technique, which is always unexceptionable and very rarely takes fire: Cowen cultivated it eagerly, but had little success; and Stanford, though he found it far more congenial and would certainly in an operatic country have had the following of secondary stage composers like Götz, Bruneau, or Catalani, failed for lack of opportunity rather than want of genius. Parry and Stanford between them, however, started what is now seen to be the third peak period of Brit. music and has by this time proved to be by far the longest, without showing any sign of decline. A much greater master than either, and in fact the major representative of this period, is Elgar. He stands head and shoulders above any other composer projecting into the 20th cent. as a striking and unrepeatable personality and a sovereign craftsman, though Delius had a vein of poetry that was his alone. The scene now becomes crowded with notable composers who had something to contribute to a busy Eng. revival. Somervell was lyrical, Bantock vigorous and pictorial; McEwen could handle the string quartet superbly, and Frank Bridge was an adept at any chamber music; Holst was enterprisingly experimental, Holbrooke amazingly prolific, Boughton eager to create a special type of national opera. Cyril Scott was the Eng. impressionist, John Ireland a sensitive poet, and Arnold Bax a late romantic with an exuberant imagination. But the greatest of that generation, who, although past his eightieth year, is still vigorously productive, and always freshly interesting, is Vaughan Williams, who may figure in the future as the fourth supreme Eng. master alongside Byrd, Purcell, and Elgar.

The 20th cent., which opens with Bliss, Howells, Benjamin, Moeran, and Peter Warlock, becomes so crowded with highly gifted but not as yet always settled personalities that it is impossible to name a few without injustice to many others. They must wait to be evaluated some time in the future. But two must be mentioned for outstanding mastery, Walton and Britten, and also because they stand at the head of a new phase, which is, at long last, the emergence of Brit. opera, recognised abroad as of international

importance. Other very gifted composers are working in this field, and it looks as though opera may take a place in 20th cent. B. M. not unlike that of the madrigal in the Elizabethan school, something based on foreign models but grown indigenous in the hands of artists who bring their own individuality to bear on it. Future generations may look upon Brit. opera as the typical neo-Elizabethan phase of music. See E. Blom, *Music in England* (Polcan books), 1948, and E. Walker, *History of Music in England* (3rd revised ed.), 1952; see also under names of composers mentioned.

British New Guinea, see PAPUA.

British North Borneo, see BORNEO.

British North Greenland Expedition, see ARCTIC EXPLORATION.

British Railways, see RAILWAYS.

British Solomon Islands Protectorate, see SOLOMON ISLANDS.

British South Africa Company, The, obtained a royal charter of incorporation in 1889, through the efforts of Cecil Rhodes, and has received supplemental charters in 1900, 1915, 1924, and 1954. Its object was to protect Rhodesia, to further commerce, and to develop mineral and other resources of the dist. over an area exceeding 700,000 sq. m. Dr Jameson was administrator of the company's ters. until the Transvaal raid, 1895-6, being succeeded by Earl Grey. In 1922 S. Rhodesia voted in favour of responsible gov., and a year later was formally annexed to the Brit. dominions. By an agreement between the Brit. Gov. and the company the company surrendered its rights and claims, buildings and assets, etc., used for administrative purposes, and its land and monopoly rights other than mineral rights under its concessions in S. and N. Rhodesia, in consideration of a cash payment of £3,750,000 and a half-interest for 40 years in the net proceeds of the disposal of land in NW. Rhodesia. On 29 June 1933 the mineral rights of S. Rhodesia were bought by the S. Rhodesian Gov. for £2,000,000, the gov. to assume all obligations imposed on the company by grants to other parties. Among the remaining assets of the company are: mineral rights throughout N. Rhodesia; citrus and other estates in S. Rhodesia totalling 134,000 ac.; a half-interest for 40 years from 1 Oct. 1923, in the net proceeds of the disposal of land by the gov. in NW. Rhodesia; about 16,000 sq. m. of mineral rights in Nyasaland; and about 81 per cent of the issued shares of Rhodesia Railways Trust.

British Thermal Unit (B.Th.U.), the amount of heat required to raise the temp. of 1 lb. of water by 1° F. The *Gas Therm* = 100,000 B.Th.U. If V = cu. ft consumed, H = declared heat value of the company's gas in B.Th.U.s per cu. ft, P = cost of therm in pence, B = total bill in pence—then $B = V \times H \times P \div 100,000$, whence the equivalent cost in pence per 1000 cu. ft = $B \times 1000 \div V = H \times P \div 100$. See also CALORIE and METROLOGY.

British Transport Commission. The object of the Transport Act, 1947, was to

provide in Great Britain a publicly owned system of inland transport including port facilities but excluding transport by air. It provided for the estab. of the B. T. C., a body corporate consisting of a chairman and not less than 4 nor more than 8 other members, all to be appointed by the Minister of Transport; the duty of the B. T. C. was to provide 'an efficient, adequate, economical, and properly integrated system of public inland transport and port facilities within Great Britain for passengers and goods.' The 1947 Act also provided for the estab. of 5 executives to exercise the functions of the Commission as agents; these were the Railway Executive, the Docks and Inland Waterways Executive, the Road Transport Executive, the London Transport Executive, and the Hotels Executive; each executive also consisted of a chairman and not less than 4 nor more than 8 other members. The various undertakings taken over by the B. T. C. were purchased by the issue of more than £1,135,000,000 Brit. Transport 3 per cent Guaranteed Stock. The 1947 Act was sponsored by a Labour Gov. When the Conservative party was returned to power in 1951 they were pledged to return to private enterprise most of the road vehicles nationalised under the 1947 Act, and the Transport Act of 1953 which aimed at competition rather than integration was passed mainly with this object. The 1953 Act also provided for the abolition of most of the executives and only the London Transport Executive (q.v.) now remains; the reorganisation of the railways and the setting up of area authorities was also provided for; the railways and other of the B. T. C.'s activities now come under the direct control of the B. T. C., and 6 area boards have been set up covering roughly the 6 railway regions.

Railways. The railways were controlled by the Minister of War Transport under Defence Regulation 69 from the outbreak of war in 1939 and remained so until they were vested in the B. T. C. of 1 Jan. 1948; the assets at the date included 19,640 route miles (52,250 track miles) of line, over 20,000 locomotives, 40,250 carriages, and 1,223,630 wagons.

Canals. Under the 1947 Transport Act, 17 separately and independently owned undertakings, 2 State-owned, and about 30 owned by railway companies, comprising over 2000 miles of waterways, were transferred to the Commission. Most of the vessels using the canals are independently owned but the B.T.C.'s fleet includes 250 power driven craft and nearly 1000 dumb craft (including 650 coal floats).

Docks. Docks previously owned by the railway and canal companies at more than 50 places, including the great groups on the NE. coast and in S. Wales and comprising over 100 miles of quay, are vested in the B. T. C.

Road haulage. Nationalisation of goods road transport undertakings was effected by the B. T. C. serving notes of acquisition in writing on persons carrying on undertakings using vehicles under 'A'

and 'B' licences and whose activities 'consisted to a predominant extent of ordinary long-distance carriage for hire or reward.' About 40,000 vehicles were acquired in this way. Under the 1951 Act about 32,500 were to be sold to private enterprise, but the Transport (Disposal of Road Haulage Property) Act, 1956 permits the B. T. C. to retain 15,000 vehicles, 4,900 of which are for disposal—Brit. Road Services (Parcels) Ltd and Brit. Road Services (Meat Haulage) Ltd—later on.

Road passenger transport. Nearly 14,500 omnibuses in the provs. and Scotland are owned by the B. T. C., mainly through the acquisition of the Tilling and Scottish Motor Traction groups; the B. T. C. also has large holdings in the Brit. Electric Transport group and other bus companies.

British transport hotels. These comprised the 45 hotels, 400 station refreshment rooms, and 500 daily refreshment car services hitherto operated by the railway companies. A few of the hotels have since been sold.

See also CANAL; CARRIER, COMMON; LONDON TRANSPORT EXECUTIVE; PUBLIC SERVICE VEHICLE; RAILWAYS.

'British Weekly,' a journal of social and Christian progress, founded by Sir Wm Robertson Nicoll in 1886. It discusses current events from the Christian point of view. It covers religious, social, political, literary, and biographical topics, and the leading articles deal principally with theological and ethical questions.

British West Africa, see GAMBIA; GHANA (GOLD COAST); NIGERIA; SIERRA LEONE.

British West Indies, see WEST INDIES.

British West Indies Regiment, see WEST INDIA REGIMENT.

Britomartis, originally a mother goddess of E. Crete. A later myth identified her with Dictynna, a similar goddess of W. Crete. Pursued by Minos for 9 months, she flung herself into the sea. To account for the name Dictynna it was related that she was saved by being caught in a fisherman's net (*diktwn*). She escaped to Aegina, where she was worshipped as Aphaea. At least as early as Euripides B. was identified with Artemis.

Britton Ferry, see NEATH.

Brittain, Vera Mary, novelist, b. Newcastle under Lyme. Her childhood was spent in Cheshire, and in 1914 she went from St Monica's, Kingswood, as an exhibitor to Somerville College, Oxford. *Testament of Youth*, 1933, tells of her experiences as a Red Cross nurse in the First World War. In 1922 she started as a freelance journalist in London, and in 1925 she married George E. G. Catlin, an Oxford man who then held the Chair of Politics at Cornell. Her novels include *The Dark Tide*, 1923, *Not Without Honour*, 1924, *Account Rendered*, 1944, and *Born*, 1925, 1949. *Testament of Friendship*, 1940, is a tribute to her lifelong friend, Winifred Holtby (q.v.). *Lady into Woman*, 1953, is a hist. of women from Victoria to Elizabeth II.

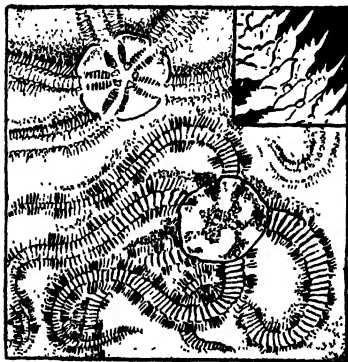
Brittany (Fr. Bretagne), old prov. in

the NW. of France, forming a peninsula between the Bay of Biscay, the Atlantic Ocean, and the Eng. Channel, and comprising the modern depts of Finistère, Côtes-du-Nord, Ille-et-Vilaine, Morbihan, and Loire-Inférieure. The country was conquered by Julius Caesar in 57-56 B.C. and was known to the Romans as Armorica. It is believed that in the 5th and 6th cents. there was a large influx into the country of Celts from Britain, fleeing from the Saxons, and the country became known as Britannia Minor. The Breton language belongs to the Celtic div. of Celtic and is allied to Welsh. To this day the Bretons maintain their distinctive customs and traditions, and their country is one of the most picturesque in Europe. In the 10th cent. B. was an independent duchy, and later was, for a time, a vassal prov. of France. During the Hundred Years War it sided alternately with England and France, and it was frequently a cause of dispute between the 2 countries. It was finally incorporated with France by Francis I in 1532. During the Fr. Revolution it supported the Bourbons. (See VENDEE, WARS OF THE). After the allied landings in Normandy in 1944, the U.S. Army, in accordance with the general strategy, began on 25 July a forceful break-out on the W. flank of the bridgehead; the whole of the Breton peninsula was rapidly in allied hands, with the exception of the fortified ports, Brest, Lorient, and St. Malo. (See WESTERN FRONT IN SECOND WORLD WAR.) See MENPOS, *Brittany*, New York, 1905; A. R. du Cleuziou, *La Bretagne*, 1947; Ralph Dutton, *Normandy and Brittany*, 1953.

Britten, Benjamin (1913-), composer, b. Lowestoft, educ. at Gresham's School, Holt, and Royal College of Music (scholarship for composition). He worked with G.P.O. film unit, 1935-7, and was in America 1939-42, being awarded the Coolidge Medal in 1941. His earliest pub. work was a *Sinfonietta* (chamber orchestra), in 1932. He has held no official or professional post, but lives a retired life in Suffolk, devoted wholly to composition. His catalogue, for one of his age, is enormous, and continues to grow rapidly; the following is an abridged abstract from it. Operas: *Peter Grimes* (after Crabbe), *The Rape of Lucretia* (libretto, Ronald Duncan, after Obeys), *Albert Herring* (after Maupassant), *Let's Make an Opera* (after Blake), *Billy Budd* (E. M. Forster, after Melville), *Gloriana*, *The Turn of The Screw* (after Henry James); incidental, film, and radio music: choral works, including *Hymn to St Cecilia* (Auden), *A Ceremony of Carols*, *Saint Nicholas*, *Spring Symphony*, *Sinfonia da Requiem*; *The Young Person's Guide to the Orchestra* (variations on Purcell), for orchestra; piano and violin concertos; *Les Illuminations*, *Serenade* for voice and chamber music; 2 string quartets; songs: *Seven Sonnets of Michelangelo*, *The Holy Sonnets of John Donne*, *A Charm of Lullabies*, and *Winter Words* (Hardy).

Brittle Stars is the popular name applied to the animals of the class Ophiuroidea

among the Echinoderms. They have many points in common with the Asteroidea, or starfish, but they are more active and muscular have no anus, the ambulacral groove on the ventral surface is covered, and the arms contain no prolongation of the viscera. The name refers to the way in which these star-shaped creatures can break off an arm; when this is done another quickly grows in its place. They are sometimes known also as sand-stars, from being found on the beach. Typical Brit. species are *Ophiura ciliaris*, *Ophiopholis aculeata*, *Ophiocoma nigra*, and *Ophiothrix fragilis*.



BRITTLE STAR (*Ophiocoma nigra*)

The inset shows a small portion of one arm enlarged.

Britton, John (1771-1857), topographer and antiquary, b. near Chippenham, Wilts. In 1801 he co-ed. with Brayley (q.v.) the *Beauties of Wiltshire*, which proved very popular, becoming the first of the series *The Beauties of England and Wales* (1801-15), 9 vols. of which were written by B. and his friend, including the equally popular *Beauties of Bedfordshire*.

Briva Currellae, see BRIVE.

Brive (-la-Gaillarde), Fr. tn. cap. of an arron., in the dept. of Corrèze, on the Corrèze. It was known to the Romans as Briva Curretiae, and has a 12th-cent. church. It has railway workshops, and manufs. of shoes, textiles, and paper, and a trade in stock, chestnuts, wine, and truffles. Cardinal Dubois and Brune (q.v.) were b. here. Pop. 33,500.

Brixen, see BRESCIANONE.

Brixham, seaport in Devon, England, on the S. side of Tor Bay, principally noted as an ant. fishing port with appurtenant industries and as a favourite yachting harbour. B. was the home of the Rev. H. F. Lyte, author of 'Abide with me.' A cave on Windmill Hill was discovered in 1858 and contains many interesting palaeolithic remains. William

of Orange landed at B. in 1688. Pop. 8760.

Brixia, see BRESCIA.

Brixton, dist. and a parl. div. in the metropolitan bor. of Lambeth, London. It is much favoured by variety stage performers. There is a well-known market and a prison.

Briza, genus of Gramineae which occur in temperate climates, and of which 2 species grow in Britain, the *B. media*, or common quaking grass (q.v.), and *B. minor*, or small quaking grass. *B. major* is a species naturalised in Guernsey. *B. maxima*, a species from S. Europe, is sown as a border annual. All species are very slight, shaking with the least breath of air, and as pasture they yield little nutriment.

Brizio (or Brizzi), Francesco (1574-1622), It. painter, b. Bologna. He studied under Lodovico Carracci, and was perhaps his best pupil, executing some admirable work. B. was also an engraver of some note.

Brno: 1. Region (*kraj*) in central Czechoslovakia, bordering on Austria, part of the former prov. of Moravia (q.v.). The N. is mountainous, but the S. is lower-lying and is watered by the Thaya, a affluent of the Morava (q.v.). Area 2786 sq. m. Pop. 931,500.

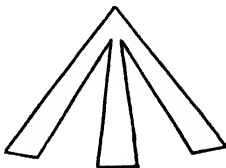
2. (Ger. **Brünn**), Czechoslovak city at the confluence of the Svitava and the Svratka, cap. of the region of B. and former cap. of the prov. of Moravia. In the Middle Ages it was a fort. tn. was the seat of the Moravian margraves, and withstood many sieges. In 1645 it was vainly attacked by the Swedes, and in 1805 it was Napoleon's H.Q. before Austerlitz (see SLAVKOV). B. has a hill-top castle, a 15th-cent. cathedral, sev. other medieval churches, and a 16th-cent. tn. hall. The modern suburbs are well-planned and spacious. The tn. is the seat of a bishop, and has a univ. (1919), a technical univ. (1892), and academies of music and veterinary science. Mendel (q.v.) was abbot of the Augustinian abbey here. B. is a centre of the textile industry, particularly woollens, and has also engineering, chemical, and brewing industries. Pop. 273,200.

Broach, or **Bharoch**, situated on the r. b. of the Nerbudda, 203 m. N. of Bombay, in Bombay state, India. is a city of great antiquity. It is referred to as early as 216 AD by the author of the *Periplus*. Eng. merchants hired a house in 1614, and the Dutch estab. a factory in 1617. It is a great centre of the cotton industry and famous for its long-staple cotton.

Broach Spire, in architecture, a form of spire chiefly used in Eng. Gothic churches of the 13th and 14th cents., especially in Northants; in which an octagonal spire rises from a square tower without a parapet, the 'broaches' being the half-pyramids joining the square to the base of the octagon.

Broad Arrow, mark of the Brit. Gov. stamped on all gov. stores. Anyone defacing this mark is guilty of felony, and anyone unlawfully in possession of

goods thus stamped can be fined £200 and costs.



BROAD ARROW

Broad-bottom Administration, name satirically given to Henry Pelham's ministry, which lasted from 1744 to 1754, the year of Pelham's death. It was so called because it admitted every man of parl. talent or influence, irrespective of party.

Broad Sound, inlet in the E. coast of Queensland, Australia. It penetrates inland for over 50 mi. and its greatest width is over 30 m.

Broadbent, Sir William Henry (1835-1907), physician, b. Lindley, nr Huddersfield. After graduating at Owen's College, Manchester (1858), continued his studies at Paris. From 1858 to 1896 he was on the active staff at St Mary's Hospital, London. At the medical school he was lecturer on physiology, zoology, and comparative anatomy, and proved an excellent clinical teacher. From 1860 to 1879 he was physician to the London Fever Hospital. He was in attendance on the Duke of Clarence at his death, 1892, and Queen Victoria, Edward VII, and George V were at different times his patients. He received a baronetcy in 1893 and was made K.C.V.O. in 1901. His hypothesis to explain the unequal distribution of paralysis, in the form of hemiplegia, is still unrefuted, whilst he first suggested with authority a separate centre for conception of ideation. His writings include *The Pulse*, 1890, and *Heart Disease* (with his son), 1907. His name is perpetuated in *B.'s sign* in adherent pericardium, which he described in 1895.

Broadcasting. Broadcasting in Britain. Until the passing of the Television Act, 1954, which legislated for the introduction of commercial television, B. was undertaken solely by the British Broadcasting Corporation (B.B.C.), a corporation estab. by royal charter to provide a public service of B. for general reception in Britain and overseas. See also INDEPENDENT TELEVISION AUTHORITY and TELEVISION, B.I.C.

When B. began in Britain in 1922, a limited company, the Brit. Broadcasting Co., combining the interests of 6 large wireless and electrical manufacturing firms, was granted a licence by the postmaster-general. The revenue was partly from royalties on the sale of receiving sets and partly from receiving licences collected by the post office. By 1926 a system of national and regional programmes, with transmitters in London,

Manchester, Birmingham, Newcastle, and Daventry, was well estab., and there were over a million licence holders. On the recommendation of the Crawford Committee a public authority was constituted under a royal charter—the Brit. Broadcasting Corporation—which came into being on 1 Jan. 1927. The staff, machinery, and assets of the old company were taken over. The royal charter required the corporation to obtain, in the same way as the company, a licence from the postmaster-general by virtue of his statutory powers under the Wireless Telegraphy Acts (consolidated in the Act of 1949). The licence states the terms and conditions under which the B.B.C. may estab. and use its transmitting stations and apparatus. It stipulates the financial conditions and does not allow the B.B.C. to derive revenue from advertising or from any sponsoring of programmes. Under the terms of the first licence in 1927 the broadcast receiving licence fee was fixed at ten shillings, payable to the post office, and the B.B.C. was to be financed by a share in the revenue from the licences.

The members of the corporation are its governors appointed by the Sovereign in Council. They are part-time appointments. The permanent executive staff is headed by the director-general. The governors are finally responsible for the sound and television programmes as well as the engineering operation. The links between studios and B. points and transmitting stations are provided by the post office which charges the B.B.C. a rental. Since 1953 national B. councils for Scotland and Wales have been responsible for the policy and the content of the Scottish and Welsh Home Services. The chairman of each national council is the corporation governor representing the area concerned.

The first royal charter was renewed in 1937 after parliamentary consideration of the Ullswater Committee's report. This new charter expressly charged the B.B.C. with the duty of carrying on the Empire Service which it had initiated in 1932. This charter also entrusted the B.B.C. with television B. in accordance with the recommendation of the Selsdon Television Committee, which was endorsed by the Ullswater Committee. The first high definition public television service in the world had already been started by the B.B.C. from Alexandria Palace on 2 Nov. 1936. The third charter was granted in 1947 when the B.B.C. was authorised to provide B. services for reception in other countries and places outside the Brit. Commonwealth. A worldwide service was in fact already in operation. In 1938 the Arabic Service and the Lat.-Amer. Service in Spanish and Portuguese began, and broadcasts in French, German, and Italian were introduced in Sept. of that year. These services were the beginnings of the external services of the B.B.C., which now include B.s in 41 languages and are received all over the world. Thirty-nine high-powered transmitters are in operation for these services, including 2 at Tebrau

in Johore which are operated by the B.B.C.'s Far E. station, mainly to rebroadcast the B.B.C.'s Far Eastern, Eastern, and General Overseas Services to the appropriate countries. Certain of the B.B.C.'s European Services are also rebroadcast by a high-powered medium wave transmitter in NW. Germany with a medium-powered relay in Berlin, as well as being rebroadcast over a VHF/FM transmitter in Berlin. The fourth charter was granted in 1952 for 10 years after parl. consideration of the Beveridge report and of gov. white papers issued by Mr Attlee's administration in 1951 and Mr

programmes are transmitted by 44 medium and long-wave stations and are also broadcast by a network of VHF stations using frequency modulation. Twelve VHF stations were in operation at the end of July 1957. By 1958 it is expected that 96 per cent of the population will be within the reach of VHF broadcasting. It was felt necessary to introduce this system because of the interference from foreign stations and from electrical apparatus.

The B.B.C. provides 4 main services for home listeners. The Home Service, running continuously from 6.25 a.m.



B.B.C.

BROADCASTING HOUSE, LONDON. TRANSMISSION REPRODUCTION ROOM
A general view of the machine room.

Churchill's administration in 1952. For the first time the licence which the B.B.C. acquired from the postmaster-general under the terms of this charter was described as 'a non-exclusive licence.' This was in anticipation of the Television Act of July 1954 and of the creation of the Independent Television Authority, and admitted the introduction of commercial television in competition with the B.B.C.'s television service.

Before the Second World War no licences were required for television reception. A combined sound and television licence was introduced in June 1946 and cost £2. At the same time the sound B. receiving licence was increased to £1. In June 1954 the combined sound and television licence was raised to £3, and in Aug. 1957 an excise duty of £1 was added bringing the licence to £4.

Eighteen transmitters radiated the B.B.C.'s television programme to cover over 98 per cent of the pop. at the end of 1957. The Home, Light, and Third

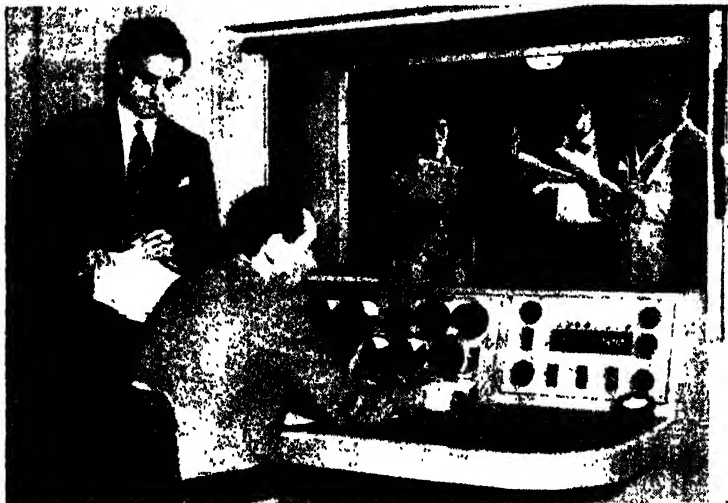
(7.50 a.m. on Sundays) to 11.08 p.m., is balanced to appeal to all sections of the community, presenting a wide range of music, drama, and outside broadcasts. Technical and scientific development as well as topical and cultural talks and features, programmes for schools and religious broadcasts are included in the output. News bulletins are broadcast at sev. daily fixed points, and when Parliament is in session there is a nightly broadcast on the day's proceedings in the House of Commons. Linked with this Basic Home Service are 6 Regional Home Services covering Scotland, Wales, Northern Ireland, and the North, Midland, and West of England. The Light Programme runs continuously from 6.45 a.m. (9.0 a.m. on Sundays) to midnight and is devoted to entertainment in the widest sense. The Third Programme, running continuously from 8.0 p.m. to 11.00 p.m. and from 5.0 p.m. to 11.00 p.m. on Sundays, is a cultural programme designed for the serious listener. Network

Three, designed for specialist minority audiences, introduced in the autumn of 1957, uses Third Programme frequencies and transmitters between 6.0 p.m. and 8.0 p.m. six days a week. The School B. Dept. of the B.B.C. sends out over 50 transmissions a week to nearly 28,000 in the U.K. (An experimental B. service for schools was first operated by the B.B.C. in 1927. The B.B.C. television B. service for schools began in 1957.)

The B.B.C. has played a leading role as patron of the musical life of Great Britain. In 1927 the B.B.C. took over the running

decided to broaden this policy to include the freest possible expression of serious responsible thought. Since 1947 a number of controversial religious broadcasts and debates have been broadcast.

Apart from the brief period of ban on controversial B., only 3 restrictions have been placed by the gov. on the corporation's programme activities. First, the rule laid down in 1927 that the B.B.C. must not express in broadcasts its own opinion on current affairs or on matters of public policy. It must maintain a policy of impartiality in any controversial



B.B.C.

THE B.B.C. IN NORTHERN IRELAND

A drama producer listening at the control room loudspeaker.

of the Henry Wood Promenade Concerts which have continued successfully ever since, with an interruption during the war years. The B.B.C. Symphony Orchestra, which was formed in 1930, has won an international reputation. In its domestic sound and television services the B.B.C. broadcasts in a year some 22,800 hours of programmes.

From 1923 to 1928 no broadcasts on matters of political, industrial, or religious controversy were allowed. This ban was lifted in 1928 when the B.B.C. was informed that the Brit. Gov. 'relied upon the governors to use the discretionary power entrusted to them . . . the responsibility for its exercise will devolve solely on the Governors. . . . After 1928 B. on political issues began to be seriously developed. In religious B. the B.B.C. itself avoided discussion of subjects likely to offend religious or moral susceptibilities, but in 1947 the governors of the B.B.C.

issue. Except in its own field of B. policy, the corporation holds no views on any public issue. The second restriction was the issuing of a formal notice by the postmaster-general in July 1955, limiting the anticipation of parl. debates by B. This was in fact the formalising of the 'Fortnight Rule,' which the B.B.C. had enforced for sev. years in agreement with the leaders of the parties, and from which it desired to disengage itself. Following the findings of a gov. committee of inquiry and an experimental period of suspension, the Prime Minister announced on 25 July 1957 that the rule was suspended for an indefinite period. (The postmaster-general's notice of 1955 was formally revoked in Dec. 1956). A further restriction issued by the postmaster-general in July 1955 required the corporation to refrain from sending any controversial party political broadcasts on behalf of any political party, other than the series

of party political broadcasts arranged by the corporation in agreement with the leading political parties, for B. throughout the U.K.

An agreement reached in 1947 between the B.B.C., the gov., and the opposition enables the gov. of the day to use the radio for ministerial broadcasts from time to time to make pronouncements of a factual nature, to explain legislation approved by Parliament, or to appeal to the public to co-operate in national policies. The agreement also provides for party political broadcasts which are allocated by agreement among the leading parties. The allocation and the details are arranged at an ann. meeting between the B.B.C. and the representatives of the main parties. Arrangements for B. during general elections are agreed between the parties and the B.B.C. before the election. The B.B.C. is required by its licence to broadcast any announcement at the request of a gov. dept. (in practice such announcements as police messages, outbreaks of animal diseases and the like). The B.B.C. is also required to broadcast an impartial day-to-day account of the proceedings in both Houses of Parliament. The B.B.C. initiated this practice in 1945, before it was laid down in the licence and agreement.

The B.B.C. publishes a weekly *Radio Times* (q.v.) with advance programme information. It has the highest circulation of any weekly pub. in the world (9 million approximately). Nearly 7 million illustrated pamphlets are sold yearly in conjunction with the broadcasts for schools.

Broadcasting outside Britain. The Netherlands are unique in that B. and T.V. are operated by free associations of listeners who pay membership fees to each association. The gov., which introduced a certain degree of unity and supervision by forming a radio union of the groups, issues licences. The revenue therefrom is distributed to the associations according to their proportion of members.

Germany was one of the countries which developed B. actively as a gov. service. Since the war, in the Federal Rep. of W. Germany, B. is no longer centralised. There are a number of independent organisations which are linked by a central working committee and each organisation follows a pattern or reflects the post-war occupation authorities—U.S.A., Britain, and France—in the way the B. bodies are organised. All of these are similar to public corporations and are financed by licensed revenue. The stations are as follows: Hamburg: Nord-Deutscher Rundfunk; Cologne: West-Deutscher Rundfunk; Frankfurt: Hessischer Deutscher Rundfunk; Stuttgart: Süd-Deutscher Rundfunk; Baden Baden: Südwest-Deutscher Rundfunk; Munich: Bayerischer Rundfunk; Berlin: Sender Freies Berlin; Rias (The American Radio Department Radio Organisation). Television has been developed in Hamburg, Cologne, Frankfurt, and Stuttgart.

In the U.S.S.R. radio development and production for the country as a whole

comes under the U.S.S.R. Ministry of Communications. Radio policy, programmes, and so on, however, are shaped by the radio committees which operate independently in each rep. No networks have been introduced over Moscow Radio since 1948. There are still 3 programmes: Moscow Home, Alternative Programme, and Third Programme. The Home Service broadcasts 49 hrs daily. Its foreign service has programmes in 36 languages. There are nearly 30,000 radio relay centres—wired wireles—in the U.S.S.R., which account for 16,000,000 individual loud-speakers. It is planned to double that number by 1960. Television services in the U.S.S.R. started soon after the end of the war. There are no commercial programmes and no advertising. Soviet designers are working on new types of television sets with screen measuring 35, 43, and 53 cm. in the diagonal. Research into colour television has been going on for sev. years, and colour television tests are made at Moscow's colour television centre. A 22-valve set, the 'Raduga,' has been adapted for colour television reception.

In Australia the official service is the Australian B. Commission, which was set up in 1932, and is responsible to the Australian Federal Parliament through the postmaster-general. Until 1948 it was financed from licence revenue. Since 1949 it has been financed from the Commonwealth Consolidated Revenue Fund. There are also 107 commercial B. stations in operation. A national television service began operating in Nov. 1956 and the commercial organisation, the Television Corporation Ltd, began transmissions in Sept. 1956.

The Canadian B. Corporation, which was inaugurated in 1936, is financed jointly by parl. grant and by commercial revenue. It is the national B. authority for both sound and television B., but it works closely in co-operation with privately owned commercial B. stations for the transmission of its programmes on a nation-wide coverage. The Canadian B. Corporation International Services, which operate on behalf of the Department of External Affairs, broadcast programmes in 14 languages on shortwave, and transmit recorded programmes in 3 other languages.

In the colonies experimental transmissions were going on as early as 1926 (British Guiana). In 1928 Kenya was the first station in the colonial territories to start regular radio broadcasts. Radio Hong Kong followed shortly afterwards, and in 1929 the first wired B. service was brought into operation at Port Stanley in the Falkland Is. Pioneering broadcasts began in Sierra Leone and in Ghana in 1934-5. In 1934 commercial B. began in Gibraltar and Barbados, and the following year in Malta and Fiji.

In 1936 the Plymouth Committee on Colonial B. recommended that B. activities should be developed as a public service by the gov. concerned. Their recommendations have been upheld and pursued.

The Central African B. Service has grown from a station in N. Rhodesia which was opened in 1941. In 1949, under the Colonial Development and Welfare Act, the Brit. Gov. made available 1 million pounds for the development of colonial B.; a further £250,000 was made available in 1952 and another £500,000 in 1955.

Since 1949 more than 40 B. schemes in 28 colonial territories have been completed or are under way. Thirty-one wireless and 13 wired B. services in the colonies transmit to audiences estimated at over 5 million. The B.B.C. has provided technical and organising advice and assistance, and has seconded engineers and programme staff to 7 colonial territories. The Nigerian B. Service became a corporation in 1957.

Broadcasting in the U.S.A. B. on a large scale began in the U.S.A. in 1920, when the possibilities of the medium for advertising purposes were recognised. A number of stations were set up by various trading concerns, including manufacturers of radio apparatus, and by 1924 over a thousand stations had been licensed. The result was uneven distribution and overcrowding of the ether, and a regulating law was passed in 1926. The following year the Federal Communications Commission was set up under the Secretary of Commerce. The Federal Communications Commission issues licences for the operation of a B. station, allocates wavelengths, and determines the strength of the station and the hours during which it operates. It can refuse to renew a licence if it is in the public interest to do so. Apart from this measure of control, B. in the U.S.A. is open to competitive private enterprise.

Later the broadcasters themselves formed an organisation called the National Association of Radio Broadcasters (now the National Association of Radio and Television Broadcasters) to protect and define good taste in presentation.

There are 4 major B. networks in the U.S.A., each of which has member stations from coast to coast. These member stations carry a certain number of network originated programmes per day, whether commercial or sustaining. The largest of these networks from the standpoint of affiliated members is Mutual Broadcasting System (M.B.S.) with 538 stations. Others are the National Broadcasting Co. (N.B.C.), Columbia Broadcasting System (C.B.S.), and the American Broadcasting Co. (A.B.C.). From the standpoint of gross advertising revenue N.B.C. and C.B.S. lead the field. N.B.C. has 194 affiliates, C.B.S. 204, and A.B.C. 338. In addition there are a number of other radio stations throughout the U.S.A. which operate independently. In July 1957 there were 3095 licensed amplitude modulation (AM), and 531 frequency modulation (FM) stations. According to figures issued in the UNESCO survey there are 127,000,000 radio sets in use in the U.S.A.

Television B. began in the U.S.A. in 1946; the network 'scheme' has been followed. On 1 Nov. 1957, 511 (including 27 non-commercial) television stations

were operating throughout the U.S.A. effectively covering over 75 per cent of the geographical area and available to over 95 per cent of the pop. In May 1957 there were an estimated 44 million television sets in use. Television in the U.S.A. operates, generally, from 7 a.m. until midnight, and sometimes as late as 1 a.m. in large metropolitan areas. The first all-colour station went on the air in Chicago in February 1956, transmitting from WNBQ (NBC/TV) 18 hours a day entirely in colour.

In addition, the U.S.A. has 22 television stations which transmit educational programmes. Some of these stations operate from funds donated to them from private grants from foundations or educational institutions.

The Amer. system of B. programmes is 'sponsored' by national advertisers, and consequently B. is entirely gratuitous to the public, while at the same time there is free competition to catch the public ear. The ann. revenue from advertisement amounts to some hundreds of millions of dollars and provides not only for the 'sponsored' programmes, but also for the 'sustaining' programmes which are produced by the B. company itself or by arrangement with cultural institutions and so on. Some stations are wholly supported by religious and educational institutions, and refrain from broadcasting advertising matter altogether. The privately owned Amer. system differs from that in force in Great Britain and the majority of European countries, where B. is financed out of revenue obtained by the State from the issue of licences for listening.

Broadcasting (Visual), see INDEPENDENT TELEVISION AUTHORITY and TELEVISION, B.B.C.

Broadmoor Institution, in Crowthorne par., SE. Berks, England, a state institution for criminal patients. It was built in 1863 and will accommodate 900 persons.

Broads, The, level dist., chiefly in Norfolk, but also in Suffolk. The B. are shallow lakes connected by 'dykes' to the rivers which intersect the country, viz. the Yare, the Bure, with its tributaries the Ant and the Thurne, and the Waveney. There is excellent yachting on the shallow broads, and the fish and wild-fowl, too, attract many holiday-makers. There is a profusion of vegetation peculiar to marshy dists. and of great interest to naturalists. Hickling (about 1½ m. long) is the largest of the Norfolk B. Other Norfolk B. are W. Walsham and Coltishall—both of which are well wooded round their margins; Barton, near Stalham, the area of which is diminished by the encroachment of reeds; Horsey, which was inundated by the sea in 1938; Ormsby, Rollesby, and Filby, all contiguous to each other and not far from Caister; and Somerton. Oulton is the largest of the Suffolk B. The whole Norfolk Broad dist. is low-lying, being only 5 ft. above sea level. Hickling Broad, twice inundated by the sea, in the 13th cent. and in the reign of Charles II, is famous for a chancery suit in which a

local fisherman, as nominal plaintiff, attempted unsuccessfully to prove that the water was tidal so as to establish public rights of fishing and mooring. The famous bird sanctuary which surrounds and includes this Broad, estab. in 1910, has lately been acquired by the Norfolk Naturalists' Trust. A project recently put forward by the National Trust and the Norfolk Naturalists' Trust, had for its object the formation of a block of protected marshland covering a large area of the Norfolk B. as a home and resting-place for rare wild birds. See W. A. Dutt and others, *The Norfolk Broads*, 1903; E. L. Turner, *Broadland Birds*, 1924; J. Robinson, *Broadland Yachting*, 1928.

Broadside, simultaneous discharge of the guns on one side of a ship-of-war. This method was discarded on the introduction of iron-clad turret-ships in which the great advantages are that projectiles glance off the rounded turrets and that the weight of guns and armour is more evenly distributed.

Broadside, see CHAPBOOKS.

Broadstairs, seaside resort, on the E. coast of the Isle of Thanet, Kent, England, 2 m. by rail N.E. of Ramsgate. There are many preparatory and boarding schools, and several large convalescent homes for children. Dickens was a frequent visitor, and wrote *Black House* after his residence here. There are sev. plaques on the walls of houses at which he lived from time to time. Pop. 15,200.

Broadsword, sword with a broad, flat blade, which is generally used for cutting, but not stabbing. Much used by the Scottish highlanders among others.

Broadway: 1. Vil. of Wores, England, 5 m. from Evesham. Beautifully situated in the Cotswolds, at the foot of B. hill. Has 17th-cent. stone houses and a building said to have been the manor-house of the abbots of Pershore. Pop. 2000.

2. Busy avenue of Manhattan, New York City, U.S.A. Its N. part contains the shopping centre and theatre dist., and to the S. is the business and financial quarter.

Broadwood, John (1732-1812), b. in Berwickshire, and walked to London to become a cabinet-maker there. With the Swiss, Burkhard Tschudi (whose daughter he married), he founded the great London pianoforte house (entering into partnership with Shudi [as he later called himself] 1769, becoming sole proprietor 1782). Sev. generations of B.s have carried on the business. B.'s great-granddaughter was Lucy B. (d. 1929), collector and editor of folksongs.

Broadwood, Robert George (1862-1917), lieutenant-general, son of Thomas B., of Holmshurst, Sussex; entered army (12th Lancers), 1881; served Dongola expeditionary force, 1896, and in Sudan campaign, 1898. B. served in S. Africa, 1889-1902, as commander of 2nd cavalry brigade. A mounted force under him was ambushed by De Wet at Sanna's Post, a number of men and guns being captured. In 1901 B. captured Gen. A. Cronje and other prisoners, during operations in the

Free State. At the beginning of the First World War he commanded the troops in E. Anglia.

Broca, Pierre Paul (1824-80), Fr. anthropologist, b. at Sainte-Foy-la-Grande, Gironde. He studied at the Municipal College of Sainte-Foy and the École Polytechnique and Faculté de Médecine of Paris. In 1846 he became assistant in anatomy to the Faculté, and in 1853 was appointed prof. of surgical pathology. Founded the Anthropological Society of Paris, 1859; estab. the *Revue d'Anthropologie*, 1872; founded the École d'Anthropologie, 1872; member of the Legion of Honour, 1868. To him medical science owes the discovery of the seat of speech in what is commonly known as the 'convolution of B.' His most important pubes. are *Des anémies et de leur traitement*, 1856, *L'Ethnologie de la France*, 1859, *Instructions générales pour les recherches anthropologiques*, 1865, *Instructions craniologiques et craniométriques*, 1875, and *Mémoires d'anthropologie* (4 vols.), 1871-1883.

Brocade, name given to a richly decorated fabric, with a slightly raised pattern, often woven with gold, silver, or gilt-silver threads. Oriental tissues, made in Persia and Asia Minor, especially from the 14th to 17th cent., are also called B.s. B. was made as early as the 13th cent. in Italy and Spain. The background was of heavy silk, or of some strong material with a soft silk face, on to which a flowered pattern of many colours was woven. At a later date, about the 16th cent., metallic and oriental fabrics became very popular. Now the word B. is applied to any rich material on which a raised pattern has been wrought. At the S. Kensington Museum there is a fine collection of old and modern B.s. which is of great interest to the decorative textile artist. Fine specimens may also be seen at various continental museums and exhibitions and at Dublin and Edinburgh.

Broccoli, Giovanni Battista (1772-1826), It. naturalist, b. Bassano. After holding the office of prof. of botany at Brescia he became in 1809 inspector of mines at Milan. He afterwards left Italy and went to Egypt where he held a commission as engineer, and d. at Khartoum. He wrote sev. important books, among them being *Conchyliologia fossile subapennina*, 1814, and *Dello Stato Fisico del Suolo di Roma*, 1820.

Broccoli, differs chiefly from cauliflower (q.v.) in being of harder constitution, but structurally similar. Varieties embrace white, purple, and green sprouting B., 'Calabrese', a tender form, and a branching B., known as Bouquet or Nine-star. With careful selection of varieties and sowing times, B. or cauliflower may be grown the year round. It produces its young flowers in compact heads, which are closely enveloped by leaves, and consequently become rather blanched in appearance.

Broch (A.-S. *burh*, burg; Scottish, brough, fortified enclosure), name applied to the round towers or strongholds existing in the N. and NW. of Scotland. About

five hundred are known in Caithness, Sutherland, Orkney, Shetland, and the Outer Hebrides. They were built during the Scottish Iron Age, and some at least were still in use at the time of the Norse raids. The essential features of construction are alike in all cases, though there is difference of detail. The interior diameter of the base varies between 25 and 35 ft. In the outer wall is a small doorway which is the only opening in this wall: it is defended by a small chamber within the wall on one or both sides of the entrance. There are holes for a sliding bar to guard the entrance. The ground-floor wall, which is about 15 ft thick, encloses a circular courtyard, open to the sky, in which a well is frequently

Copenhagen Univ., becoming prof. there in 1870. B. wrote a treatise on Spinoza (1857).

Brock, Sir Isaac (1769-1812), Brit. major-general, b. St Peter Port, Guernsey. Served in W. Indies, Holland, and Canada. In 1806 he took command of troops in Canada in view of the imminent outbreak of hostilities between Great Britain and U.S.A. With a small force he compelled the Amer. general Hull to surrender (1812). He was killed in the battle of Queenstown Heights.

Brock, Sir Thomas (1847-1922), Eng. sculptor, b. Worcester. Chief pupil of Foley (q.v.), afterwards his assistant. B. executed a bronze bust of Lord Leighton, 1873, and a marble one of Queen Victoria,



THE BROCH OF MOUSA

E.N.A.

found. Narrow, circling galleries, arranged in tiers, are built into the interior of the wall, and connected by a staircase from base to summit. These galleries are lighted and ventilated from the inner area or courtyard by means of windows placed in perpendicular rows, and separated from each other by single slabs of stone. No B. is complete in its upper parts, so that it is impossible to tell the original height and the number of galleries built into the inner wall; a height of about 40 ft is probable. Small, beehive-shaped chambers are built within the walls on the ground floor. The B.s often stand within an enclosure which contained round or oval huts. They were strongly defended, but there is ample evidence from their situations and from the relics found in them that the occupants were intensive farmers who were also concerned with a sea life. The B. of Mousa is exceptionally well preserved. See V. G. Childe, *Prehistoric Communities of the British Isles*, 1949 ed.

Bröchner, Hans (1820-75), Dan. philosopher. He studied theology and philosophy, and worked for some years at the

1901. Among his equestrian statues may be mentioned that of the Black Prince, set up in City Square, Leeds, 1901, and that of the Maharajahs Bahadur and Ranadip Singh for the cap. of Nepal. He designed statues of Richard Baxter (for Kidderminster, 1870), Robert Raikes (Victoria Embankment, 1888), Sir Bartle Frere (same place, 1896), Gladstone (Westminster Hall, 1902), Capt. Cook (the Mall, 1914), Rowland Hill, Sir Richard Temple (for Bombay), Sir Richard Owen, and Dr Philpott. The monument to Lord Leighton in St Paul's, and Longfellow's bust in Westminster Abbey, are further specimens of B.'s work. He designed and executed the imperial memorial to Queen Victoria in front of Buckingham Palace. Among his other works are 'The Moment of Peril,' purchased under the Chantry bequest for the nation; 'The Genius of Poetry'; 'Song,' 1891; 'Eve' (Tate Gallery). B. shows power as a portraitist; there is dignity and refinement in all his work. R.A., 1891; K.C.B., 1911; membre d'honneur de la Société des Artistes français.

Brocken, or **Blocksberg** (ancient Mons Brueterus), highest summit (3747 ft) of the Harz Mts (q.v.), in Germany. It has an interesting optical illusion, called 'the B. Spectre' (q.v.), caused by the projection of the spectator's shadow into the mist while the sun is setting. According to folklore it is the witches' meeting-place on Walpurgis-Night (see WALPURGA, ST), and here the witch scene in Goethe's *Faust* is laid.

Brocken Spectre, see ANTHELION.

Brookes, **Barthold Heinrich** (1680-1747), Ger. poet, b. Hamburg. His chief poetical works were pub. in 9 vols. as *Irdisches Vergnügen in Gott*, 1721-48. He trans. Marini's *La Strage degli Innocenti*, Pope's *Essay on Man*, and Thomson's *Seasons*. His poetry marks the transition from it. influence to that of Fr. literature. He started a simple, clear diction, and his reverential attitude towards nature and a religious interpretation of natural phenomena paved the way for Klopstock. See A. Brandl's life, 1878; also Strauss, *Brookes und Reimarus* (Gesammelte Schriften, II), 1876, and K. Lohmeyer, *Brookes in seinen Gedichten*, 1935.

Brockhaus, **Friedrich Arnold** (1772-1823), Ger. publisher, b. Dortmund, Westphalia; the founder of the well-known publishing firm of B. in Leipzig. He started business in Amsterdam, 1805, and was so successful that in 1817 he removed to Leipzig, where he combined the trades of book-printing and publishing. B. bought, 1808, the copyright of the *Conversations-Lexikon*, which had been begun by Löbel in 1796, and in 1810-11 completed the first ed. of this famous work. It was, from the first, a great success, and has been revised and kept up to date by new eds.; the 16th ed. was pub. 1952-7 at Wiesbaden, the publishing house having been removed there from Leipzig after expropriation by the Communist Gov. See A. Hübscher, *150 Jahre F. A. Brockhaus*, 1955.

Brookesby, **Richard** (1722-97), physician, b. Minehead, Somerset. He received his medical education at Edinburgh and Leyden, at which latter he proceeded M.D. 1745. He was M.D., Dublin and Cambridge, 1754, and became a fellow of the Royal College of Physicians in 1756. As physician to the army he served in Germany during the Seven Years War, 1756-63, and in 1764 pub. *Oeconomical and Medical Observations . . . tending to the Improvement of Military Hospitals*, considered the best book of the cent. on military sanitation. He settled in practice in London and attained a considerable reputation. He was the physician and friend of Johnson, Burke, and Wilkes, to the first two of whom he was also a generous benefactor.

Brockley, residential dist. in SE. London, partly in the bor. of Deptford and partly in Lewisham.

Brockram ('broken rock'), local name applied to certain breccias belonging to the Lower Permian age, which are found near Appleby, Penrith, Kirkby Stephen, and in other parts of the N. of England. These breccias consist of broken pieces of

limestone embedded in a red sandy matrix.

Brockton, formerly **N. Bridgewater**, in the co. of Plymouth, Massachusetts, U.S.A., on the New York, New Haven, and Hartford railroad, 20 m. S. of Boston. Its most important industry is the manuf. of boots and shoes (there are over 50 firms here), but it also manufs. leather goods, clothing, paper boxes, bakery products, and beverages, and has a printing industry. Pop. 62,860.

Brockville, tn on the N. shore of the St Lawrence R., and co. tn of the united cos. of Leeds and Grenville, Ontario, Canada, 72 m. S. of Ottawa. Called 'the City of the Thousand Is,' it has a fine harbour and is on the main line of the Canadian National railways, from Toronto to Montreal, and also on a Canadian Pacific branch line to Ottawa. Centre of a good dairy farm country. Has a collegiate institute and vocational school and business college. The tn owns 29 is. which are municipal parks used for camping. Industries include furnaces, hardware, electric cables, condensed dairy products, and petrol engines. The tn was founded in 1784 by United Empire Loyalists and takes its name from Gen. Sir Isaac Brock. Incorporated in 1832 as a tn with 1300 inhab. Pop. 13,560.

Brockwell Park, London recreation ground in Lambeth bor. between Tulse Hill and Herne Hill, opened to the public in 1892.

Brocomagus, see DRUMATH.

Brodhead, **John Romeyn** (1814-73), Amer. historian, b. Philadelphia, Pennsylvania; was called to the Bar at New York, but gave up his time to research in Amer. colonial hist.; was sent to Europe to gather material for the early hist. of New York; this was ed. in 15 vols. (1856-86) by O'Callaghan and Fornow. B. also wrote a *History of the State of New York* (2 vols.), 1853-71, covering the years 1609-64 and 1664-91. A third vol., planned to cover 1691-1789, was never completed.

Brodiaea, genus of cormous or bulbous plants, native to W., N., and S. America, family Liliaceae; about 30 species. Grown in gardens for their clusters of blue flowers in spring.

Brodick, vil. and watering-place of Arran, Scotland, on a bay of the same name. Near it is B. Castle, seat of the Duchess of Montrose. A steamer calls at B., Lamish, and Whiting Bay, also at Lochranza during the season.

Brodie, **Sir Benjamin Collins** (1783-1862), surgeon, b. Winterslow Rectory, Wilts. He studied at St George's Hospital, London, to which he afterwards became assistant surgeon (1808) and surgeon (1822). He was elected fellow of the Royal Society in 1810 and awarded its Copley medal in 1811; he was president in 1858. B. was sergeant-surgeon to William IV and Victoria. He was president of the Royal College of Surgeons (1844) and the first president of the General Medical Council (1858). He wrote *Diseases of Joints*, 1818, and numerous medical papers which, with his

autobiography, were repub. in his *Collected Works*, 1865. Biography by T. Holmes, 1898.

Brodie, William (d. 1788), burglar, b. Edinburgh, the son of a cabinet-maker, who was a member of the town council; he succeeded to his father's business, was a deacon of the Incorporation of the Edinburgh Wrights and Masons, and a city councillor. He early acquired a taste for gambling, and in 1786 he became leader of a gang, which committed a number of burglaries in 1787. In 1788 they broke into the excise office, and though they escaped undiscovered, one of the gang turned king's evidence, and B. was finally arrested in Amsterdam and hanged. He is the subject of Stevenson and Henley's play, *Deacon Brodie*.

Brodie, William (1815-81), sculptor, b. Banff, but spent most of his life in Edinburgh. In 1877 he was elected secretary of the Royal Scottish Academy. He specialised in portrait busts, and numbered among his sitters Queen Victoria, whose bust executed by him is in Windsor Castle, and Sir James Simpson, of whom he executed the statue in Princes Street Gardens, Edinburgh.

Brody, in the L'vov Oblast of Galicia (q.v.), W. Ukraine, 50 m. N.E. of L'vov. Pop. (1921) 11,000, before Second World War mostly Jewish. It was founded in 1584, and prior to the First World War was an important trading centre. Much fighting took place in 1914-16, 1920, and 1944.

Brodzinski, Kazimierz (1791-1835), Polish poet. Joined the Fr. army, taking part in the Russian campaign, 1812-13; 1826, prof. of Polish literature at Warsaw Univ. till it was closed, 1831. The idyllic poem *Wielka*, 1820, is B.'s chief work. He trans. the Book of Job and Schiller's dramas.

Broek, Dutch vil., with an exaggerated reputation for cleanliness, 6 m. N.E. of Amsterdam, prov. of N. Holland. It has a great dairy farm. Pop. 1700.

Broekhuizen (Broukhuis), Jan Van (1649-1707), Dutch poet and scholar, b. Amsterdam. He began as an apothecary, but forsook this employment after some years and entered the army, retiring on pension in 1697. His fame rests on his *Carmina* (Lat. poems), 1684; *Poemata*, pub. after his death in 1712; and on his eds. of Propertius, Tibullus, and Catullus. He also wrote a number of poems in Dutch on the model of Hooft, which were pub. collectively in 1712.

Broefelt, Johannes, see AHO.

Brogan, Denis William (1900-), historian, b. Rutherglen near Glasgow, of Irish parentage. He was educ. at Rutherglen Academy, Glasgow Univ., Balliol College, Oxford, and Harvard. For a time he lectured on Amer. hist. at London Univ., was elected a fellow of Corpus Christi College, Oxford, in 1934, and in 1939 was appointed prof. of political science at Cambridge and elected a fellow of Peterhouse. He is one of the greatest interpreters of Amer. hist. to the Brit. people and of the Brit. outlook to Americans. During the Second World

War he was an intelligence officer with the B.B.C. and received the Legion of Honour. His works include *The American Political System*, 1933, *Lincoln*, 1935, *The Development of Modern France*, 1940, *The English People*, 1943, *The American Problem*, 1944, *The Era of Franklin D. Roosevelt*, 1950, *The Price of Revolution*, 1951, and *Politics in America*, 1954.

Broghill, Baron, see BOYLE, ROGER.

Broglie, de, name of a prominent Fr. family of Piedmontese origin, who emigrated to France in 1643. The founder of the Fr. line of the family, François Marie (d. 1656) distinguished himself as a soldier and became a general in the Fr. army. It was his grandson François Marie (1671-1745) who founded the ducal family, becoming both a duke and a marshal of the kingdom of France. He joined the Fr. army at an early age, taking a leading part in the war of the Sp. Succession. He was present at the battle of Malplaquet and at numerous other battles during the war. On the outbreak of war in 1733 he took part in the campaigns in Italy and was in the following year made a marshal of France. He afterwards became Governor of Alsace, and took part in the early stages of the war of the Austrian Succession (1740-8). His son, Victor François (1718-1804), was by the time his father d. recognised as one of the most promising Fr. generals. He served with distinction through the war of the Austrian Succession, but he estab. his great name as a soldier during the Seven Years War (1756-63). He took part in the whole of this campaign, and was made a marshal of France and a prince of the empire. After the war he did not take any active part in the military life of France, being in disgrace at the Fr. court, but in 1778 he was partially restored to favour and given command of the troops who were to operate against England. On the outbreak of the revolution he became an *émigré* and fought against the revolutionaries. His son, Victor Claude, Prince de B. (1757-1794), supported the Fr. Revolution, having previously fought in America, with Lafayette. After commanding the revolutionary army in Switzerland, and having been a member of the Jacobin Club and of the Constituent Assembly, he was guillotined by the Terror in 1794.

Achille Charles Léonce Victor, Duc de Broglie (1785-1870), Fr. statesman and diplomat, son of Victor Claude, Prince de B. (see *supra*). He took part in the diplomatic work of the Napoleonic empire, and was a member of the council of state. In 1814 he was invited to become a member of the Chamber of Peers by Louis XVIII. He had already had his peerage restored to him, and in 1815 he defended Marshal Ney and was the only member of his House who voted for his acquittal. In the following year he married a daughter of Madame de Staël. He took a prominent part in the politics of France between 1817 and 1830. Under Louis Philippe he was foreign minister, and signed a treaty with England. After Napoleon III's *coup d'état*, 1851, he retired from political

life and devoted himself to literary work. His literary work, while not of outstanding merit, won for him a place in the Fr. Academy.

Jacques Victor Albert, Duc de Broglie (1821-1901), Fr. writer and politician, eldest son of the above. Up to 1848 he took some active part in diplomatic missions, serving both in Madrid and Rome. The revolution of 1848, however, drove him from political circles, and he devoted his time to literature, being in 1862 elected a member of the Fr. Academy. In 1871 he again entered active politics and was for a short time Fr. ambas. in London. Hostile criticism led him to resign that post, and he re-entered the Chamber of Deputies. In 1873 he became president of the council and minister for foreign affairs, and later minister of the interior. In 1877 he again became premier, but was almost immediately forced to resign. After 1877 he devoted himself to literature and wrote a number of historical studies. Among his most important works are *Frédéric II et Louis XV*, 1885, and *Voltaire avant et pendant la Guerre de Sept Ans*, 1898.

Louis Victor, Prince de Broglie (1892-), Fr. scientist, b. Dieppe; youngest child of Victor, fourth prince and fifth duc de Broglie. Like his elder brother, the sixth duke, he has devoted himself to physical science, and at the age of 30 he produced a thesis on the 'wave-like' properties of matter. Since 1928 he has been prof. of theoretical physics at Paris Univ. In 1929 he was awarded the Nobel prize for physics, for his discovery of the undulatory nature of electrons. He became a member of the Fr. Academy in 1944; and a foreign member of the Royal Society in 1953. Pubs. include *Ondes et Mouvements*, 1926, *Conséquences de la relativité dans le développement de la mécanique ondulatoire*, 1933, *Une Nouvelle théorie de la lumière*, 1940, *De la mécanique ondulatoire à la théorie du Noyau*, 1943, and *Physics and Microphysics* (trans. Dr M. Davidson), 1955.

Brogue (Gaelic *brog*), originally a shoe made of coarse hide or half-tanned leather, formerly worn by the native Irish and the Scottish highlanders, now used of a style of rather stout shoe laced over the instep with ornamental punching on the winged toe-cap. The word is also applied to the pronunciation of English peculiar to the natives of Ireland.

Broiling, see COOKERY.

Broke, Sir Philip Bowes Vere (1776-1841), rear-admiral, was b. Broke Hall, near Ipswich. He entered the navy in 1792, and was made captain of the frigate *Shannon* in 1806. On 1 June 1813 he fought his famous duel with the Amer. frigate, *Chesapeake* (q.v.), and succeeded in flying the Brit. colours on the enemy's mast after fifteen minutes' fierce struggle. B., however, received a wound which permanently disabled him, and was obliged to retire from active service. He received a baronetcy in 1813, and two years later was created K.C.B.; promoted to the rank of rear-admiral in 1830. See his life by Dr Brighton, 1866.

Broken Hill: 1. Tn of N. Rhodesia, with an important mine of same name producing lead, zinc, and vanadium. It is a railway centre. Pop. (Europeans) 5000; (Africans) 40,000.

2. Mining city of Yancowinna co., New S. Wales, Australia, near the border with S. Australia, 700 m. W. of Sydney. It is the richest silver-mining centre of the continent to which Sturt referred in 1845 as a worthless country. Situated in a hot, arid area, only its prodigious mineral wealth has enabled B. H. to develop into a prosperous and comfortable city. The prin. minerals produced are silver, lead, and zinc. Pop. 32,000.

Broken Hill Proprietary (or B. H. P.), Australia's one large-scale heavy industry before the Second World War, and still by far the largest. Since the previous war it had developed at Newcastle, New S. Wales, the largest steel works in the Brit. Empire, and also a second plant at Port Kembla, 150 m. S. of Newcastle. In 1954-5 these 2 plants produced 2,162,000 tons of ingot steel. Port Kembla is now the larger of the 2 plants. The remarkable story of B. H. P. began in 1883, when a boundary rider working on a sheep station discovered traces of silver-lead in a corner of the station now known as Broken Hill. He induced 6 other men, including the station owner, to gamble £100 each on his proposal to develop the mine which he surmised to be there. The mine, in fact, turned out to be exceptionally rich. In 1885 the B. H. P. Co. was formed; in 1886 it paid dividends at the rate of 63½ per cent, in 1888, 126 per cent, and in 1937 it was still paying 120 per cent. In 1889 the company found difficulty in getting high-quality iron-ore for its smelters, and so leased some neglected iron deposits in Spencer Gulf, S. Australia, and exploited these for 10 years, but only to provide iron for fluxing purposes. When, in 1911, the company saw that the prospects for non-ferrous mining at Broken Hill were limited, they turned their attention to the production of steel and, on the coal-fields of Newcastle, New S. Wales, began to build what was to become the largest steel plant in the Brit. Empire. Since 1935, when it absorbed its last possible competitor, it has enjoyed a monopoly in Australia. It controls the materials used in its processes; produces its own iron, limestone, dolomite, fluorspar, and coal; has built a plant to handle alloys; and owns the shipping required to move its materials to Newcastle, especially the iron ore from S. Australia. It is closely interlocked with workshops producing black and galvanised sheets, barbed wire, nails, wheels, axles, and so on through the role of steel-processing industries. In association with General Motors Holden Ltd, a partly Amer. concern, and the B. H. Associated Smelters Proprietary of Port Pirie, it began, in 1937, the biggest aircraft development in the hist. of Australia—a project of very great value to Australia when war broke out. B. H. P. is also interested in gold-mining. It is the prin. Australian

ally of Imperial Chemical Industries. B. H. P., as has been well said, 'sits at the centre of capitalistic power in Australia, a vertical and horizontal trust, and a holding company, and it certainly wields a good deal of political influence' (*Advance, Australia—Where?*, by Brian Penton, 1913).

Broken Knees, condition to which horses are liable after a fall upon what is called the knee-joint. The joint, however, corresponds to the wrist in man, and is composed of a number of delicately jointed bones. If the forelegs of a horse give way, it is apt to fall upon this joint, causing more or less severe injury. If only an abrasion of the skin occurs, the wound will cause little trouble, but if the sheath of the tendon is injured, or if the bones of the joint are fractured, healing is a slow process, and is likely to be accompanied by fever. Even when the treatment is successful and healing takes place in such cases, the action of the animal is likely to be impaired. *See also HORSE, Diseases.*

Broker, agent employed to negotiate bargains and contracts, sales and purchases of goods or services for a fee called brokerage. A B. does not act in his own name, nor does he have the custody of the goods about which he negotiates; he cannot sell the goods publicly; no personal liability attaches to him for the goods in which he deals. A B. usually specialises in one market, thus acquiring knowledge which gives him an advantage over the general merchant or private buyer or seller. As well as ordinary commercial B.s, there are stockbrokers (*see STOCK EXCHANGE*); insurance B.s, who effect general and marine insurance policies; bill-brokers, who buy and sell bills of exchange and promissory notes, making a profit on the difference between the discount at which they have bought or sold the note and the interest at which they have borrowed to effect the deal (in this kind of transaction they act not as agents but as principals, and are not therefore bill-brokers in the older sense of that term, which meant agents who, for a commission, discounted bills in London on behalf of country bankers); shipbrokers, who procure goods on freight or charter for outward-bound ships and clear vessels at the customs (as well as acting as insurance B.s); and pawnbrokers (q.v.), whose business is to advance money on goods pledged as security for the loan. *See also COMMISSION.* *See Sir Oscar Hobson, How the City Works, 1956.*

Brokerage, fee or commission given by a principal to a broker or mercantile agent as payment for a bargain concluded by him.

Bromal (CBr_2COH), yellow oily liquid formed by the action of dry bromine on alcohol. It boils at 172° and unites with water to form a solid hydrate, melting at 43° . It is decomposed by alkalis into formic acid and bromoform. The hydrate is used in medicine as a hypnotic, i.e. to produce sleep, in doses up to 5 grains, but its use is usually accompanied by gastric

disturbances. In larger doses it has a dangerous poisonous action upon the heart.

Bromberg, *see BYDGOSZCZ.*

Bromborough, *see BERINGTON.*

Brome, Alexander (1620–66), Brit. poet, was an attorney by profession. Besides publishing a vol. of *Songs and other Poems*, 1661, in which he freely satirised the Stump Parliament, he tried his hand, as was the fashion, at elegies, epigrams, and trans.

Brome, Richard (d. 1652), Brit. dramatist. Little is known of his early life. It is certain, however, that he acted as a servant to Ben Jonson, from whom he acquired much of that writer's style and ability. Jonson himself referred to him in his lines 'To my faithful servant and most loving friend.' B. wrote for the Globe and Blackfriars theatres, and for the Cockpit in Drury Lane. His best-known plays include *The Northern Lass*, 1632, *The Antipodes*, *The City Wit*, *The Sparagus Garden*, 1635, and *A Jovial Crew*, 1641. He also collaborated with Thomas Heywood in *The Late Lancashire Witches*, 1634. A good notice of B. is to be found in Ward's *English Dramatic Literature*, 1875 (vol. II).

Brome-grass is the name of various species of true grasses belonging to the genus *Bromus*, occurring in temperate climates. Sev. species are common annuals in Britain, but they are of no value to the farmer. *B. secalinus* grows in fields. *B. racemosus* in meadows, *B. sterilis* and *B. mollis* in hedgerows. Some species of *Brachypodium* are called false B.

Bromeliaceae, family of monocotyledons, about 1000 species, native to tropical America; many epiphytic, others tree-like plants, with showy inflorescences and berry or capsule fruits. Genera include *Acanthostachys*, *Ananas*, *Billbergia*, *Bromelia*, *Caristum*, *Portea*, *Dyckia*, *Hechtia*, *Picramnia*, *Puya*, *Tillandsia*, and *Vriesea*.

Bromfield, Louis (1896–1956), Amer. novelist, b. Mansfield, Ohio. He was educ. at Cornell and Columbia Univs. During the First World War he served with an Amer. ambulance attached to the Fr. Army from 1917 to 1919, receiving the Croix de Guerre. He won immediate notice with his first book, *The Green Bay Tree*, in 1924. *Early Autumn* won the Pulitzer Prize of \$1000 for the best piece of Amer. fiction in 1926, and *The Strange Case of Miss Annie Spragg*, 1928, consolidated his position as a writer of note. Other novels are *The Rains Came*, 1938, *Night in Bombay*, 1940, *Until the Day Break*, 1942, *Mrs Parkington*, 1943, and *Mr Smith*, 1951. Collections of short stories are *It had to Happen*, 1936, *It Takes all Kinds*, 1939, *Mainbar Farm*, 1948, and *Out of the Earth*, 1950.

Bromic Acid (HBrO_3), monobasic acid formed by passing chlorine into bromine-water; or by the action of dilute sulphuric acid in barium bromate; or by adding bromine to a strong solution of silver bromate. The acid is known only in its aqueous solution, forms salts called

bromates, and decomposes at 100° C. into water, oxygen, and bromine.

Bromide of Potassium (KBr), colourless or white crystalline solid prepared by the action of bromine on potassium hydroxide solution. It is used in medicine as a sedative in conditions such as epilepsy, delirium tremens, hysteria, sleeplessness, and anxiety states. Its excessive use leads to a condition called bromism, or brominism, characterised by skin eruptions, growing muscular and sexual weakness, mental dullness and feebleness, leading to extreme depression and melancholia. In photography B. of P. is used as a restrainer, and as a source of silver bromide for the sensitive film.

Bromine (symbol Br, atomic weight 79.916, atomic number 35), element, was discovered by Balard of Montpellier in 1826 in the mother-liquor obtained after the crystallisation of salt from concentrated bittern (salt water from the marshy dists. of Bouche-du-Rhône), and has since been found to exist in all sea-water and in most mineral waters and salt springs. It derives its name from *Gk bromos*, signifying stench, in allusion to its unpleasant smell. B. is at ordinary temps. a volatile, heavy, mobile liquid of a reddish-brown colour, giving off reddish-brown vapour and boiling at 59° C. The vapour when inhaled dilute resembles chlorine in smell and in attacking the throat and nose, but in addition it has a very harmful effect on the eyes. The liquid is very poisonous and produces burns on the skin. It is slightly soluble in water, the solution being known as bromine water, which has a slight bleaching action, and is used in analytical chem. for oxidation purposes. The presence of a salt of B., i.e. a bromide, can be detected by passing chlorine through the solution, when B. is liberated, and can be dissolved out by ether. It turns starch yellow. B. is one of the family of elements called halogens (sea-salt producers) owing to the similarity of their sodium salts to sodium chloride. The members are fluorine (F 19), chlorine (Cl 35.457), B. (Br 79.916), and iodine (I 126.92). They are very similar in properties, and show a gradation of properties corresponding to the gradation of atomic weights. They are univalent, and severally displace one another thus: fluorine displaces chlorine, B., and iodine, chlorine displaces B. and iodine, B. displaces iodine—from their salts. The properties of B. are intermediate between those of chlorine and iodine. Thus at ordinary temps. chlorine is a gas, B. a liquid, and iodine a solid. Chlorine and hydrogen unite slowly in daylight, but violently in direct sunlight, hydrogen and B. need to be heated to unite, while hydrogen and iodine combine only partially. The chief source of B. is the crude carnallite in the saline deposits of Staßfurt in Prussian Saxony and of the U.S.A. This substance contains B. combined with magnesium, the magnesium bromide forming 1 per cent of the magnesium chloride in the crude deposit. The B. is liberated from the bromide by chlorine, which is separ-

ately generated. The hot mother-liquor flows down a tower filled with earthenware balls, and meets an up-current of chlorine. B. is liberated, and the vapour passes up out of the top of the tower into a worm, where it is condensed. The condensed vapour as it leaves the worm is collected in a bottle, while any uncondensed vapour passes into a tube of moist iron filings, where it forms iron compounds and none is wasted. Electrolytic methods have been employed for B. production, as it is found that on the electrolysis of the mother-liquor all B. comes off before any of the chlorine. In the U.S.A. B. is extracted on a very large scale from sea-water, which is acidified with sulphuric acid and then treated with chlorine. The prin. use of B. is in making ethylene dibromide, $C_2H_4Br_2$, a constituent of ethyl petrol. By passing hydrogen and B. through a hot platinum tube, hydrogen bromide, or hydrobromic acid gas (HBr) is produced, also by the action of B. on slightly moistened red phosphorus. It is a colourless, pungent-smelling gas which, when dissolved in water, forms a liquid strongly resembling aqueous hydrochloric acid. It reacts with metallic oxides, hydroxides, and carbonates to form bromides, salts which are widely used in photography, especially the bromide of silver.

Bromley, Sir Thomas (1530-87), judge. As crown counsel he prosecuted the Duke of Norfolk for treason. He succeeded Bacon as lord high chancellor. He delivered the classic judgment in Shelley's case (q.v.), and signed the warrant for the execution of Mary Queen of Scots.

Bromley, William (1769-1842), line engraver, became, in 1819, associate engraver of the Royal Academy. Besides being a constant exhibitor at the Royal Academy, he spent many years engraving the Elgin Marbles, after G. Corbould's drawings. Some of his better known works are 'Death of Nelson,' after A. Davis; 'Duke of Wellington,' after Sir Thomas Lawrence; and 'Woman taken in Adultery' (Rubens).

Bromley: 1. Municipal and parl. bor. of Kent, England, 10 m. from London, on the R. Ravensbourne. The fine Gothic church, containing monuments of sev. of the Bishops of Rochester, destroyed by enemy action in World War II, is being rebuilt. B. College provides endowed homes for 40 clergymen's widows. B. high school (founded 1883) is a public day school for girls. Bickley and Hayes are residential dists and the vil. of Keston is now incorporated in the bor. Pop. 64,800.

2. Dist. near Bow (q.v.), E. London. It contains a fine Tudor manor house.

Bromoform, or **Tribromomethane** ($CHBr_3$), bromine analogue of chloroform, is a clear, heavy liquid (sp. gr. 2.77) turning red on standing, owing to formation of bromine; discovered by Lowig in 1832, but its true nature discovered by Dumas. It is produced by adding bromine to alcohol or to an alcoholic solution of caustic potash. It is decomposed on boiling with caustic potash to

potassium bromide and potassium formate. B. smells and tastes like chloroform, and because of its high density it is used in separating-processes in mineralogy.

Brompton, residential dist. of Kensington, London, between Knightsbridge and Chelsea. It contains the B. Oratory (served by priests of the order of the Oratory of St Philip Neri), the Imperial Institute, S. Kensington Museums, and a hospital for consumptives.

Brömsbro, vil. in Sweden, 29 m. S. of Kalmar, near the mouth of the Brömse. Treaties were signed here between Denmark and Sweden in 1541 and 1645.

Bromsgrove, mkt tn of Worcs, and 13 m. SW. of Birmingham. It is situated in a pleasant, well-wooded country, has an Edward VI grammar school, and a fine church in the Decorated Eng. style. Minor industries are carried on. Pop. 28,550.

Bromus, see BROME-GRASS.

Bromwich, West, see WEST BROMWICH.

Bromyard, small mkt tn in Herefordshire, England, 10½ m. ESE. of Leominster. Pop.: urb. dist. 1695; eccles. dist. 2700.

Bronchi, main branches of the trachea. The trachea divides into the right and left main bronchus. These, ringed with cartilage in the same manner as the trachea, are the main air pipes into the right and left lungs respectively. The right bronchus is slightly larger than the left. The main B. split up into smaller B., and these in turn into minute end branches, or bronchioles, which terminate in the air cells of the lung tissue (see LUNGS). The bronchial system is exactly similar to the branching of a tree, and

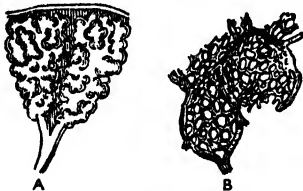
so unless or until potency of the tube is restored.

Bronchitis, inflammation of the bronchial tubes. Acute B. may be caused by infection from one or more of many organisms either already present in the system or conveyed from an external source, or may occur as an extension of an infection of the upper respiratory tract. It may also be caused by the inhalation of irritating substances such as gases or dusts, but in these cases secondary bacterial infection always occurs. The inflamed epithelium of the bronchial tubes secretes more mucus and this is coughed up as sputum, but owing to the inflammatory thickening of the lining of the tubes and their consequent narrowing, the secretions are often difficult to get rid of. The drainage is defective and so to cough is unproductive. B. is sometimes classified as B. or bronchiolitis according to whether the inflammation is in the larger or smaller tubes. This classification is largely theoretical, because the respiratory tract is continuous, and it is impossible to say from examination just where inflammation ends. In certain parts it may even extend beyond the bronchioles into the air cells, causing localised patches of pneumonia, while at others it may stop in the larger tubes. Therefore it is more usual now to refer to acute respiratory infection without attempting a precise anatomical definition of the extent of the infection. *Chronic B.* results from repeated or persistent inflammatory episodes in the bronchial tubes so that eventually they and the lung tissues are disorganised anatomically and functionally. Fibrous tissue takes the place of normal tissue, gaseous exchange is restricted, the sufferer is permanently short of breath and liable to acute exacerbations of his chronic condition. Industrial occupations which involve the inhalation of certain harmful dusts are predisposing causes of a chronic B. and fibrosis, called pneumoconiosis. We have also, for example, the anthracosis (q.v.) of coal-miners, the silicosis (q.v.) of quarry-workers and stone-masons, and the byssinosis (q.v.) of cotton operatives.

Bronchocele, diverticulum, or small blind passage, leading from a bronchus.

Brondesbury, dist. of London, near the W. boundary of Hampstead, in the urb. dist. of Willesden (q.v.).

Brongniart, Alexander (1770-1847), eminent Fr. chemist and mineralogist, b. Paris, the son of an architect. In 1797 he was appointed prof. of natural hist. at the Collège des Quatre Nations. Three years later he became director of the porcelain factory at Sèvres, which under his management became known far and wide for its work. He did not abandon purely scientific studies, and it was he who proposed the div. of reptiles into the 4 classes of Saurians, Batrachians, Chelonians, and Ophidians. Among his most notable works were his *Traité des arts céramiques* and the *Description géologique et minéralogique des environs de Paris*, in which he collaborated with Cuvier. He d. in Paris on 7 Oct.



BRONCHI

A, a bronchiole opening into two collections of air-sacs. B, the arrangement of the blood-vessels which lie underneath the epithelial lining (not shown) of two air-sacs.

because of this is known as the bronchial tree. The epithelium lining the larger tubes is ciliated, i.e. has spontaneously moving filaments, and these cilia sweep the secretions of the lungs and bronchial system always onwards and upwards towards the trachea, from where they are cleared from time to time by coughing. Bronchial tubes may become blocked either by superabundant secretions from inflammatory conditions, or by a growth or by a foreign body, in which case the section of lung supplied by the blocked tube is cut off from the air and collapses. It will remain

Broni, It. tn. in Lombardy (q.v.), 10 m. SE. of Pavia (q.v.). It has a castle and a collection of incunabula. Pop. 7000.

Bronkerspuit, streamlet in the Transvaal, 40 m. from Pretoria, scene of a Boer ambush in the S. African war, 1880. After refusing to surrender, 56 men were killed and 101 wounded. It is still a matter of argument whether this was a 'justifiable attack or a treacherous massacre' ('Times' *History of the Boer War*, vol. i).

Bronn, Heinrich Georg (1800-62), Ger. geologist, was b. Ziegelhausen, near Heidelberg. His *Index Palaeontologicus* contains a record of fossils that has proved of great service to palaeontologists. He was successively prof. of physics and lecturer on zoology at Heidelberg Univ.

Bronstein, Lev Davidovich, see TROTSKY.

Brontë, Charlotte, Emily, and Anne, novelists and poetesses, were 3 gifted members of a singularly unfortunate family. Of the 3, Charlotte was long regarded as the most brilliant, and her work gained her a place among the leading novelists of her time; but Emily's *Wuthering Heights* is a story of remarkable realism and imagination. Anne had not the intellectual force of her sisters. Their strength and originality have kept for them a leading place in Eng. fiction which seems likely to prove permanent. Their father, the Rev. Patrick B., was Irish, their mother, Maria Branwell, a native of Cornwall. The 2 eldest children of the marriage, Maria and Elizabeth, were b. at Hartshead in Yorks; the rest, Charlotte (1816-65), Patrick Branwell (1817-48), Emily (1818-48), and Anne (1820-49), at Thornton, near Bradford. In 1821 the family removed to Haworth, in Yorks, to the living of which Mr B. had been presented. In this lonely place, on the border of the bleak Yorks moors, the children spent their youth. Their father was naturally of an austere disposition, and this was intensified by the death of the mother in 1821. Henceforward he spent most of his time in his own room, and allowed the household management to be in the hands of his eldest child, a girl of 8. This loneliness encouraged the children in imagining stories, and so we find them all interested in production of a juvenile magazine, Charlotte being specially versatile. In 1824 the girls were sent to a school for the daughters of clergymen, recently opened at Cowan's Bridge. Charlotte has described it as Lowood in *Jane Eyre*, and herself declared that her account was in no respect exaggerated. The B.s suffered intensely, and in 1825 the 2 eldest girls were removed, and both d. soon after their return home. The younger girls left the school in the autumn of the same year, and on Charlotte in turn devolved the duty of superintending the home and the younger children. She stayed at Haworth until 1831, and then went to a school at Roe Head house, where she later became a teacher, and spent some of the happiest years of her life. Again we have references to this period in *Jane Eyre*. Some

of the acquaintances made now became her lifelong friends. In 1835, however, her health gave way, and she had to resign her post. An aunt suggested that the sisters might attempt a small private school, since Charlotte found that the position of governess in a private house was quite unsuited to her. It was impossible to contemplate this without having some knowledge of French, and so from 1842 to 1844 Emily and Charlotte resided in Brussels. The period seems to have had little effect on the younger sister, as far as her subsequent literary work was concerned, but Charlotte studied not only the language, but the people, to be repro-



CHARLOTTE BRONTË

duced afterwards in living characters in *Villette*. During their separation, while Charlotte was in Brussels, and Anne in a situation as governess, they had been quietly pursuing their favourite occupation; and in 1845 they seem to have first discovered each other's poetical efforts. In the following year they issued a vol. of poems, by 'Currer, Ellis, and Acton Bell', each one keeping her own initials. The little book was almost ignored, though what notices it did receive were not unkind. There is little real genius in it, with the exception of a number of pieces by 'Ellis Bell'. The young writers, however, were not discouraged, but forthwith each proceeded to write a novel. Charlotte's was *The Professor*; Emily's *Wuthering Heights*; Anne's *Agnes Grey*. The work of the 2 younger sisters was accepted; Charlotte's was rejected on the ground that the plot was too slight, but favourable consideration was promised to a longer novel. Nothing daunted, she began *Jane Eyre*, which was accepted in

1847. The success of the book was extraordinary. Charlotte had not cared for it, since its sensational plot was, she thought, unsuited to her powers. But the unusual characterisation, the masculine force of expression, and the powerful use of dramatic situations, took the reading world by storm. The name and personality of 'Currer Bell' were eagerly canvassed; but it was not until the pub. of her second book, *Shirley*, that the secret was revealed. In *Jane Eyre*, and later in *Villette*, she had made a more or less faithful autobiographical study. In *Shirley* (1849) she attempted to portray the character of her sister Emily. It abounds in humour, and is a delightful story, but it is said that she was deeply wounded by the reviews passed upon it. In the year between *Jane Eyre* and *Shirley* she had been passing through the most tragic period of her life. For years the only brother, Branwell B., had been a trial to his sisters. He was certainly not so gifted as they, and it has been said in his defence that the austerity of the Yorks parsonage and the melancholic tendencies of his sisters were enough to excuse much. Certain it is that when Charlotte returned from Brussels she found him a hopeless alcoholic, and the succeeding years, to his death in Sept. 1848, marked only a decline in his manhood. In Dec. of the same year, the brilliant but morbid genius Emily followed, and in 1849 the gentle Anne. Charlotte alone was left of the whole family. The fame which had disclosed her name in 1849 brought her many friends, and gave her the passport to the best literary society of London, but her retiring nature led her to prefer life in the N. country. In 1853 appeared *Villette*, her most charming story, showing her excellences and defects more plainly than either of the others. It is a better study of herself than *Jane Eyre*, and its quiet, delightful humour is more evident. 'Monsieur Paul Emmanuel' is her best creation, while her description of her school-teaching experiences is marked by shrewd characterisation. In 1854 Charlotte married Arthur Bell Nicholls, the curate of Haworth. He proved a kind partner, although he was opposed to the continuation of her literary work. She seems to have spent the last year of her life very happily. The usual comparison with Jane Austen is almost inevitable in connection with Charlotte B.'s work, since there is so evident a similarity between. Both were careful artists in words, and both were more at home with everyday types of humanity than with wild adventure. Both were rather portrait-painters than makers of plots. On the other hand, Jane Austen is far more a novelist of the ten-table than Charlotte B. The latter had far more dramatic power and more vigour; her work was, in a word, more ambitious than that of the earlier writer. Jane Austen wisely confined herself to the parlour and parlour topics; Charlotte B., if she did not range much further afield, yet shows a power of dramatic suggestion which is quite unlike anything in *Pride and Prejudice* or its

companions. Emily B.'s genius was of a more gloomy nature than that of her sister. *Wuthering Heights* (1847) is an extraordinary piece of work, one which fascinates by its strange wildness of treatment. Her characters may be unreal and strained, but the spirit of the bleak moor has seldom been better expressed. Her poetry, apart from her celebrated 'Last Lines', and 'The Old Stoic', gives little indication that she was one of the band who 'sing because they must.' Anne, the youngest, was the gentlest if least intellectual. Her 2 novels, *Agnes Grey*, 1850, and *The Tenant of Wildfell Hall*, 1848, are far weaker in treatment and texture than any of her sisters' work, her poetry, also, being below the average of that of Emily B.

There is a memorial to the B. sisters in Westminster Abbey, London, bearing the final line from Emily's 'Old Stoic': 'With courage to endure.' The 1932 ed. of the collected works of the B. sisters was ed. by T. J. Wise and J. A. Symington, in 20 vols. This includes, besides the novels and poems, life and letters (4 vols.), unpublished works (2 vols.), and a vol. of bibliography. See also C. K. Shorter, *Charlotte Brontë and her Circle*, 1896; C. Brontë and her Sisters, 1905, and *The Brontës: Life and Letters* (2 vols.), 1908; May Sinclair, *The Three Brontës*, 1912; B. E. Dimnet, *The Brontë Sisters*, 1924 (trans. from Fr. ed., 1910); I. C. Clarke, *Haworth Parsonage, a Picture of the Brontë Family*, 1927; E. F. Benson, *Charlotte Brontë*, 1932; E. M. Delafield, *The Brontës: their Lives recorded by their Contemporaries*, 1935; G. E. Harrison, *Haworth Parsonage, a Study in Wesley and the Brontës*, 1937; F. E. Hatchford, *The Brontës' Web of Childhood*, 1941; P. Bentley, *The Brontës*, 1947; Laura T. Hinkley, *The Brontës: Charlotte and Emily*, 1948; M. Lane, *The Brontë Story*, 1952; M. Spark and D. Stanford, *Emily Brontë*, 1953. For juvenilia of Charlotte B., see Fannie E. Hatchford, *Legends of Angria*, a compilation from early writings, 1933.

Bronte, tn in Sicily (q.v.), at the W. foot of Mt Etna (q.v.), 24 m. NW. of Catania (q.v.). It has sev. fine churches. The dist. produces wine, nuts, and olive oil, and there are woollen and paper manufs. Nelson (q.v.) was created Duke of B. in 1799 by Ferdinand I of Sicily. Pop. 20,000.

Bronx, The, formerly a dist. in Westchester co., New York; since 1898 northernmost of 5 bors. of New York city. Bounded by Harlem, Hudson, and East Rrs., and Westchester co. Area 41 sq. m. Contains B. Park, with its fine zoological and botanical gardens. Pop. 1,451,280.

Bronze, one of the earliest known alloys, formed of copper and tin in varying proportions, and often containing lead and zinc, together with small quantities of manganese, iron, and silicon. It is harder, more fusible, and less malleable than copper. The prin. varieties are gun-metal (q.v.) containing up to 10 per cent of tin and zinc and up to 5 per cent of lead; bell-metal (q.v.), up to 30 per cent

tin; phosphor B., up to 10 per cent tin and 0.5 per cent phosphorus; statuary-B., of which a representative composition is copper 78.5 per cent, tin 2.9 per cent, zinc 17.2 per cent, lead 1.4 per cent. Brit. B. coins are copper 95 per cent, tin 4 per cent, and zinc 1 per cent. B. is also used in machinery bearings and for pump-plungers, etc. See H. C. Dewa, *The Metallurgy of Bronze*, 1930.

Bronze Age. The, one of the 3 main stages in the worldwide development of prehistoric man based on the tools, implements, and weapons which he used. The scheme was first put forward in Denmark by J. C. Thomsen (see PREHISTORY) and later developed by Brit. and Fr. archaeologists. The B. A. was not a simultaneous phenomenon the world over. The use of the metal originated in Hither Asia, and its use, together with the great benefits in agriculture and general trade which it conferred, gradually spread to those regions where ore could be obtained under suitable conditions, and to areas such as Egypt and Mesopotamia where an organised trade was already in existence. In Europe, the Iberian peninsula and Ireland became important as centres of production.

In the Early B. A. in Britain, and against the background of the Neolithic and the Beaker Folk (q.v.), 2 cultural provs. are outstanding. In N. England, especially in Yorks, SW. Scotland, and Ireland, a characteristic thick and heavy pottery has given its name to the Food Vessel Culture, which seems in many places to have been a continuation of that of the Beaker Folk. It depended largely on sheep-raising and barley-growing, but by reason of its geographical situation, this prov. also took an important part in the metal trade between Ireland and the Continent. The people were of a distinct brachycephalic physical type. They wore woollen dresses which buttoned down the front. Little bronze was used, although the halberd was an important weapon, but there was a brisk trade in jet ornaments and in plano-convex knives of flint. In the food vessels themselves there is often more than a hint of Neolithic Peterborough pottery. The cultural prov. centred in Wessex between c. 1500 and 1400 B.C. derived much wealth from its agriculture and pastoralism. It was in profitable trade communication with central Europe and the E. Mediterranean on one hand, and with the gold-producing areas of Ireland on the other. It imported stone battle-axes and amber trinkets from Scandinavia, developed the socket as a mounting for weapons, and buried its cremated dead under large round barrows. (See BARROWS.) The Wessex Culture was ruled by aristocratic chieftains who were able to exchange their agric. wealth for the luxuries brought in by foreign trade.

The Middle B. A. saw the extended use of cremation, and the development of a special type of ceramic known as the 'overhanging rim' urn, together with the manuf. of the bronze rapier, palstave, and spearhead with loops on the socket. The

Urn Culture folk were still agriculturalists and pastoralists on a large scale; sheep-raising was widespread, and the economy was further supported by hunting. Many burials but few settlements are known, and an outstanding feature of the period is the construction of circular monuments of wood and stone which betoken a great ceremonial ritual. The Urn Culture saw a long survival in the Highland region where it lasted until the Early Iron Age.

The Late B. A. in Britain is remarkable for a great development in the use of metal for tools, weapons, utensils, and such outstanding objects as shields, and musical trumpets based on the form of a cow's horn. Technique was at an advanced level, and many hoards of bronzes, which include smith's gear, broken goods, and foundry metal, point to the great importance of the itinerant smith. Such workers brought into Britain new types of bronzes from the Continent, among them the heavy slashing sword with leaf-shaped blade. The folk movements, of which this probably formed a part, introduced into S. England at least, about 800 B.C. new ideas in farming based on the use of the animal-drawn plough, and new styles of pottery known from their prin. places of discovery as Deverel-Rimbury urns. Earthworks on the downs of Wilts and Dorset have been identified as cattle ranches used at this time. Towards the very end of the B. A., say from 600 B.C. onwards, some forerunners of the Early Iron Age peoples began to appear sporadically in Britain, and in current archaeological thought the B. A. is said to terminate at about 450 B.C.

There is no convenient synthesis of B. A. material in Britain and the Continent, and what is said here must be regarded as no more than the briefest of outlines subject to modification as current research progresses. See ARCHAEOLOGY; BEAKER FOLK; IRON AGE; PREHISTORY; STONE AGE.

See Stuart Pigott, *British Prehistory*, 1949, Ch. III; Jaquetta Hawkes, *Guide to the Prehistoric and Roman Monuments in England and Wales*, 1951; Brit. Museum, *Later Prehistoric Antiquities of the British Isles*, 1953.

Bronze-wing is a name applied to many Australian species of the pigeon family Columbidae. *Phaps chalcoptera* is the common B., *P. elegans*, brush B., and *Ocyphaps lophotes*, crested B.

Bronzing, name given to various processes by which a bronze-like or other metallic surface is given to objects of metal, plaster, or wood. Plaster figures are made to have an appearance of old bronze by first painting green with paint mixed with shellac and then painting over with bronze powder, especially the more prominent parts. This bronze powder consists of finely divided brass, copper, aluminium, or other metal to which a particular depth of shade has been given by oxidation. New metal articles are made to have the green appearance so admired in bronze antiques by brushing over with a solution of sal-ammoniac and salt of sorrel boiled in vinegar. Again, metal

articles can be made almost any colour by immersions in suitable solutions such as platinum chloride. In printing, the design is printed with shellac instead of ink and the sheet treated with bronze powder, any surplus being brushed off carefully.

Bronzino, Il (Angelo Allori) (1503-72), It. painter, of the Florentine school, b. Monticelli, pupil of Jacopo da Pontormo (q.v.). Portrait-painter at the court of Cosmo I, Duke of Tuscany. Other works are 'The Descent of Christ into Hell,' in the Uffizi Gallery, Florence, and the magnificent allegory, 'Venus, Cupid, Folly, and Time' (National Gallery) in which he rose above his normal dignified level to greatness.

Bronzite, crystalline mineral with lustre giving it a resemblance to bronze. It is classed as a pyroxene of the rhombic section and is similar in composition to enstatite (which is magnesium silicate), but in addition contains 5 to 14 per cent of protoxide of iron. It is the sixth and most infusible mineral on Von Kobel's scale of fusibility, being fusible only in very small flakes before the blow-pipe. It is very slightly pleochroic and is foliated. Its presence is fairly common in igneous rocks.

Brooch (from Fr. *broche*, an awl or bodkin), ornamental dress-fastening, usually consisting of a disk or a semi-circle, with a fastening of the safety-pin type (*fibula*) attached to it. B.s. are of great antiquity, and were once worn by men as well as by women. The earliest B.s. were of bronze, and were often crude representations of animals. The early B.s. of Scotland and Ireland were of the ring shape, and often displayed rich ornamentation and fine workmanship. Sev. admirable examples are preserved among the highland families of Scotland, while one of the best Irish examples of these old Celtic B.s. is the Tara B. in the museum of the Royal Irish Academy, Dublin. Finds of Romano-Brit. and A.-S. work are skilfully enamelled. Early B.s. have also been found in Scandinavia and parts of S. and central Europe, where they seem to have originated.

Brook, Clive (1891-), actor, b. London. He served in the First World War and then went on the stage, playing his first part, in the provs.: Philip Evans in *Fair and Warmer*. He first appeared in London at the St Martin's Theatre, 1920, as Hugh Crauford in *Just Like Judy*, and later the same year as Foxcroft Grey in *Over Sunday*. He went to Hollywood in 1920, where he had a most distinguished and successful career for over 20 years. He was highly esteemed by Amer. audiences as being the typical Eng. gentleman, well dressed and behaved, restrained and polished, but he always showed strength and nervous tension in his performances. He has since returned to the stage and also played on television with success.

Brook, Peter (1825-), theatrical producer, b. London. Educ. Gresham's School and Magdalen College, Oxford; married Natasha Parry. He is regarded to-day as one of the most brilliant,

imaginative, and inventive of the younger school of producers. Since 1943 he has a long and notable list of productions, which include *Pygmalion*, *King John*, *The Lady from the Sea*, *The Brothers Karamazoff*, *Measure for Measure* (at Stratford-on-Avon), *Venice Preserved*, at the Lyric, Hammersmith, and *The Little Hut* in New York; and, also in New York, *Faust* in 1953, *The Dark is Light Enough*, *Both Ends Meet*, and *The House of Flowers*, all in 1954. Back in England he produced *The Lark* and, at Stratford-on-Avon, *Titus Andronicus* in 1955. He also designed the costumes and prepared the music for the latter productions. He is as much at home with opera as with plays, and has done distinguished work at Covent Garden, notably with the operas of Benjamin Britten. He directed the film version of *The Beggar's Opera* in 1953 and did a television production of *King Lear* in New York in the same year. He has written a play, *The Birthday Present*, for television. He is one of the youngest and most brilliant producers for the modern stage.

Brook Farm, in Massachusetts, 8 m. SW. of Boston, became in 1840 the scene of a communistic experiment, inspired by the transcendentalism of the time. The attempt was organised by George Ripley, who gathered around him a number of highly educated men and women to carry into practice the ideal of 'a more natural union between intellectual and manual labour.' Hawthorne resided on the farm for some time, and it was visited by Emerson and other well-known men of the day. The attempt ended in failure, and was abandoned in 1847.

Brooke, Alan Francis, see ALAN BROOKE, VINCOUNT.

Brooke, Baron, see GREVILLE, SIR F.
Brooke, Charlotte (1740-93), compiler, b. Cavan. Educ. by her father Henry B. (q.v.) she studied the Irish language, and after his death, being reduced to poverty, she pub. by subscription *Reliques of Irish Poetry*, 1789, the first noteworthy collection of trams, from early Irish verse.

Brooke, Frances (née Moore) (1724-89), Brit. novelist, wife of a chaplain to the Eng. Army in Quebec. She wrote first *The History of Lady Julia Mandeville*, 1763, which is notable for its descriptions of Canadian scenery. In her next novel, *The Excursion*, she made a butt of Garrick, the actor. Afterwards she wrote plays, the best of which were *The Siege of Sinope*, 1781, and *Rosina*, 1783, the latter a musical comedy.

Brooke, Henry (c. 1703-83), novelist and poet, b. Cavan, Ireland. He studied law at Trinity College, Dublin, but embraced literature as a career, producing poems, dramas, and novels. The only one of his works now read is *The Fool of Quality* (5 vols.), 1766-70, which was a favourite novel of John Wesley. His poem *Universal Beauty*, 1735, was admired by Pope, and is said to have suggested Erasmus Darwin's *Botanic Garden*.

Brooke, Henry (1903-), politician, educ. at Marlborough and Balliol College,

Oxford. He was M.P. for W. Lewisham, 1938-45, and M.P. for Hampstead since 1950. He was a prominent Conservative member of the L.C.C., 1945-55; in 1954 he became financial secretary to the Treasury. He was appointed Minister of Housing and Local Gov. and Minister for Welsh Affairs, 1957.

Brooke, Sir James (1803-68), Rajah of Sarawak, was b. Coombe Grove, near Bath, on 29 April, his father being in the service of the E. India Co. After being educated at Norwich, he entered the E. India Army in 1819, and, after being seriously wounded in the Burmese war, he finally quitted the service in 1830. While travelling in the E. he conceived the idea of putting down the plague of piracy in the beautiful is. of the E. Archipelago and bringing the blessings of civilisation to the inhab. Needless to say, no one but a very remarkable man, and one filled with the spirit of adventure, would have ever thought seriously of carrying out such a project, but B. tried and succeeded. Inheriting £30,000 on his father's death in 1835, he equipped a yacht, carefully trained his crew, and, after preliminary cruises, sailed in Oct. 1838 for Sarawak, on the NW. coast of Borneo. On arrival he found some of the native tribes in revolt against the Sultan of Brunel. He assisted in putting down the rebellion, and was rewarded with the title of Rajah of Sarawak. He immediately set to work to reform the prov., and his excellent gov. soon brought civilisation and prosperity in its train. He pursued vigorous methods against the pirates, but the rigour of his crusade brought him into trouble with the Brit. House of Commons, and he was charged with receiving 'head-money' for the pirates who were slain. After inquiry, however, he was exonerated. He was appointed governor of Labuan when that is. was purchased by the Brit. Gov. He received the honorary degree of D.C.L. from Oxford, and was created K.C.B. in 1848. He d. on 11 June at Burrator in Devon, an estate which had been purchased for him by public subscription. He was succeeded in Sarawak (q.v.) by a nephew.

Brooke, Rupert Chawner (1887-1915), poet, b. Rugby, where his father was a housemaster at the school. From there he went to King's College, Cambridge. He settled at the Old Vicarage, Grantchester, subject of one of his most famous poems, and numbered among his friends Edward Marsh, Gosse, Drinkwater, de la Mare, W. W. Gibson, W. H. Davies, and the Asquiths. In 1911 he was made a fellow of King's, pub. a small vol. of poems, and planned the anthology *Georgian Poetry* with Harold Monro (q.v.). In 1913 he had a year of travel, crossing America and going on to Hawaii, Samoa, Fiji, and Tahiti, but his plans were interrupted by the First World War. Obtaining a commission in 1914 he was with the Royal Naval Div. at Antwerp, and in 1915 was sent to the Dardanelles, but d. of septicaemia in Scyros, the fabled is. of Achilles. B.'s poems won great celebrity, both because the war sonnets in the

posthumous vol. *1914 and Other Poems* caught the prevailing spirit of splendid and selfless patriotism, and because he himself typified the flower of Brit. youth which was being ruthlessly sacrificed in the so-called 'war to end wars.' His *Complete Poems*, 1932, show his kinship with Keats and the Elizabethans. His critical work, *John Webster and the Elizabethan Drama*, was pub. in 1918 and vols. of his letters and collected prose in 1956. See J. Drinkwater, *Rupert Brooke, an Essay*, 1916; W. de la Mare, *Rupert Brooke and the Intellectual Imagination*, 1919.

Brooke, Stopford Augustus (1832-1916), clergyman and scholar, b. Letterkenny, Donegal. Educ. at Trinity College, Dublin, he carried off the prize for divinity and also for Eng. verse. He was ordained in 1857. After a couple of London curacies, he was in 1863 appointed chaplain to the Princess Royal at Berlin. After his return he became minister at St James's Chapel, York Street, a position he held until 1875, when he was appointed chaplain to Queen Victoria. He seceded from the Church of England in 1880, and was until 1895 Unitarian minister at Bedford Chapel. He made his mark quickly as one of the most prominent of Eng. men of letters. His chief pubs. are *Life and Letters of the Rev. F. W. Robertson*, 1865, *Freedom in the Church of England*, 1871, *Theology in the English Poets*, 1874, *English Literature*, 1876, *Riquet of the Tuft: a Love Drama*, 1880, *History of Early English Literature*, 1892, *Tennyson*, 1900, *The Poetry of Robert Browning*, 1902, *Ten Plays of Shakespeare*, 1905, *Studies in Poetry*, 1907, and *Ten More Plays from Shakespeare*, 1913. Late in life he took up painting, and succeeded remarkably. See L. P. Jacks, *Life and Letters of Stopford Brooke*, 1917.

Brookfield, vil. in NE. Illinois, U.S.A., suburb of Chicago. B. Zoo is near by. Incorporated, 1893. Pop. 15,500.

Brookings Institution, Washington, created in 1923 by the amalgamation of an Institute for Gov. Research, an Institute of Economics, and a Graduate School of Economics and Gov., all founded by Robert S. Brookings (1850-1932). Purposes: conduct of research projects in the social sciences; training of scholars; provision of research resources for U.S. and visiting foreign scholars; pub. of studies it has furthered.

Brookite, trimorphous form of titanium oxide (TiO₂). It is found in small brownish black, orthorhombic crystals in igneous rocks and is named after H. J. Brooke, an Eng. mineralogist of the early 19th cent. Occurs especially in Tyrol and Arkansas.

Brooklands, see MOTORING.

Brookline, see VERONICA.

Brookline, tn in Norfolk co., Massachusetts, U.S.A., a wealthy residential suburb of Boston, with some manufs. Pop. 57,600.

Brookline Country Club, see CLUBS.

Brooklyn, formerly a city, is, since 1898, bor. of New York City, U.S.A. It is situated on Long Is., opposite Manhattan

bor. The 2 bors., between which flows the East R., are connected by the B., Manhattan, and Williamsburg bridges, and by the B.-Battery tunnel (1950). The water-front of B. is 35 m. long, whilst its docks, lined with immense warehouses, grain elevators, etc., are very extensive. On Wallabout Bay is the B. navy yard. Besides carrying on an enormous import and export trade, its manufs. are extensive, embracing sugar-refining, brewing, carpets, steam-bollers, glass, chemicals, clothing, processed foods, paper, etc. Among its many public buildings and charitable institutions may be mentioned the City Hall, of white marble, the Institute of Arts and Sciences, the B. Academy of Music, Museum, and Botanic Garden. B. is celebrated alike for its schools—including the Polytechnic for boys, B. College, the Pratt Institute, St. John's Univ., St. Joseph's College for Women, Lond. Is. Univ., Lond. Is. College of Medicine, etc.—and for its churches of all denominations, where the most distinguished preachers officiate. The city is very popular as a residential suburb of New York. It has also many public pleasure-grounds, including Washington Park and Prospect Park. The latter extends over 540 ac., and has 2 splendid boulevards. It lies on rising ground at the SW. of the city. The Dutch of New Amsterdam first founded the colony of B. (Breuckelen) in 1636. It was incorporated as a tn in 1816 and as a city in 1834. B. bridge cost \$25,094,577 and is 6016 ft in length. B. was long known as the City of Churches, but is now also a city of homes. The pop. is 2,738,175. The Soldiers' Monument was erected in memory of 148,000 soldiers who d. in the Civil war. The navy yard is one of the foremost in the country. The Children's Gardens contain a herbarium of 150,000 specimens. A noble monument in Prospect Park is in memory of the men and women of B. who d. in the First World War. B. public library contains 975,000 vols. The old B. Heights section of the tn has changed rapidly from a residential to a bustling business and apartments house dist. See also NEW YORK CITY.

Brooklyn Institute of Arts and Sciences, New York, has grown out of the Apprentices' Library Association, which was founded in 1824. The present institute was incorporated in 1890, and its object is to encourage every manifestation of art and science, especially as applied to daily life, and to provide facilities for anyone wishing to study any branch of art or science. For this purpose the B. I. is divided into a number of depts under various heads. Courses of lectures, etc., are organised and command a large attendance. The Brooklyn museum, comprising exhibits in the fine arts, in natural science, and in ethnology, was first opened under the auspices of the B. I. in 1897. The museum, which includes a children's section, is continually expanding, and among its activities numbers the pub. of science bulletins, memoirs of art and archaeology, and a quarterly periodical. The museum library contains 22,000 vols.,

and adjoining the museum are the Botanic Gardens of over 50 ac., visited by more than a million people each year. Another dept is the Brooklyn Academy of Music.

Brooks, Charles William Shirley (1816–1874), journalist and novelist, b. London. Beginning life as an articled clerk in a lawyer's office, he forsook law for journalism and after a time became connected with the *Morning Chronicle* as parl. reporter. He contributed 'Essence of Parliament' to *Punch*, and succeeded Mark Lemon as editor in 1870. He wrote various plays and novels, and pub. the results of a Russian tour in *The Russians of the South*, 1854. His novels include *The Gordian Knot*, 1860, *The Silver Cord*, 1861, and *Sooner or Later*, 1868. Life by G. S. Layard, 1907.

Brooks, Maria (1795–1846), Amer. author, b. Medford, Massachusetts. She was a friend of Robert Southey, who praised her work and called her Maria of the W., after which she wrote under the name of 'Maria del Occidente.' She pub. poems entitled *Judith, Esther, and other Poems*, 1820, *Zophiel*, 1834, *Idomen, or The Vale of Yumuri*, 1843. See Griswold, *Female Poets of America*, 1849.

Brooks, Phillips (1835–93), Amer. preacher and author, b. Boston, Massachusetts. He entered the Protestant Episcopal Church, and first at Philadelphia, and later as rector of Trinity Church, Boston (1869–91), he estab. a high reputation as a preacher. He became Bishop of Massachusetts in 1891. He pub. various vols. of sermons and some well-known hymns.

Brooks, Van Wyok (1886–), Amer. literary critic, b. Plainfield, New Jersey. Educ. at Harvard, he worked in England for some time as a journalist. His first book, *The Wine of the Puritans*, 1909, was a social study. From 1903 to 1911 he did lexicographical work in New York, and after that was for 2 years instructor in English at Leland Stanford Univ. After returning to England in 1913 he wrote *America's Coming of Age*, 1915. In 1920 he settled at Westport, Connecticut. His best-known works are *The Ordeal of Mark Twain*, 1920, *The Pilgrimage of Henry James*, 1925, *Emerson and Others*, 1927, *The Life of Emerson*, 1932, *Sketches of Criticism*, 1932, *The World of Washington Irving*, 1944, *The Times of Melville and Whitman*, 1947, his 5-vol. *Makers and Finders: a History of the Writer in America, 1800–1915*, 1936–52, *Scenes and Portraits*, 1954 (reminiscences), *Helen Keller*, 1956, and *From a Writer's Notebook*, 1958.

Brooks, William Robert (1844–1921), astronomer, b. Maldstone, Kent, and later emigrated to America. Prof. of astronomy, Hobart College, and director of the Smith Observatory, New York. Discovered many new comets, some of which are named after him.

Brooks's Club, see CLUBS.

Brookwood, see WORKING.

Broom, see BRUSHES.

Broom is the name given to sev. species of leguminous plants, but chiefly to those which belong to the genus *Cytisus*, a

native of Europe and the Mediterranean. The common B. of Britain is *C.* (or *Sarcothamnus*) *scoparius*, an evergreen shrub in which the leaves have been reduced to scales. It grows in very poor soil, and attains a height of about 3 ft; the flowers are bright yellow and in structure resemble those of the pea (papilionaceous); the fruit is a dark brown legume with a curious explosive mechanism. The flowers are devoid of nectar, and are pollinated by insects which, attracted by the bright colour, visit the flowers to obtain food in the form of pollen. The leaves in the lower part are divided into 3 leaflets, but



the upper scale-like leaves are simple; the wood is a dark greeny-black, and is used in making besoms. *Cytisus albus*, the white B., is a native of Portugal, as is *C. patens*, the falsely named Irish B.; *C. proliferus*, a Sp. species, is used for fodder in Madeira. *C. purpureus*, the purple B., is a hardy plant, which when grafted with *Laburnum anagyroides* has produced a chimera, *Laburnocytisus × adami*. Species of *Genista*, while also included under the name of B., are more commonly called whin or furze, and are noted for their branches, which are reduced to thorns. *G. monosperma* is a native of Spain which grows on the coast, has white flowers, and yields a useful fibre.

Broom-corn, Common Millet, or *Panicum miliaceum*, is a species of the family Gramineae. Its seeds are widely used as a staple food. See MILLET.

Broom-rape, see ORORANCE.

Broome, William (1689–1745), Eng. writer and translator, educ. at Eton and Cambridge. Part-author of prose trans. of the *Iliad* (1712). He condensed Eustathius' notes on Homer for Pope; collaborated with Pope and Fenton in translating the *Odysses* (1725–6). B. also pub. sermons and poems, and trans. Anacreon for the *Gentleman's Magazine*. See Dr Johnson, *Lives of the Poets*, 1799–1781; W. Elwin and W. J. Courthope, *Pope's Correspondence*, 1871–2.

Broome, seaport of W. Australia on the NW. coastline. The adjoining coast supplies more than three-fourths of the pearl-shell supply of the world. There is a fully equipped native hospital here. There is an air service to B. from Perth. Pop. 1264.

Broons, tn of France, in the dept of Côtes-du-Nord. It was the bp. of Bertrand du Guesclin. Dinan is 16 m. to the NE. Pop. 2400.

Brophy, John (1899–), novelist, b. Liverpool. In 1914, when not yet 15, he enlisted and fought for 4 years in the First World War. After it he studied at Liverpool Univ., spent 2 years as a teacher in Egypt, worked in an advertising agency and as a reviewer of fiction, and during the Second World War ed. *John o' London's Weekly*. In 1930 he collaborated with Eric Partridge (q.v.) in *Songs and Slang of the British Soldier, 1914–18*. Two early novels with a Liverpool background are *The Bitter End*, 1928, and *Waterfront*, 1934. *Immortal Sergeant*, 1942, and *Spearhead*, 1943, are war stories. *Gentleman of Stratford*, 1939, is a novel about Shakespeare.

Broora, vil. and resort of Sutherland, Scotland, some 17 m. NE. of Dornoch by road, at the mouth of the B. R. which here joins the N. Sea. Coal is mined. Pop. 1074.

Brosböll, Johan Karl Christian, see ETTLAR, CARL.

Brosicus is a genus of Coleoptera in the family Carabidae, or ground beetles. They are carnivorous, and are remarkable for the almost total absence of indented striae on the elytra and for their large and strong mandibles. *B. cephalotes* is found under stones and rubbish on Eng. sea coasts.

Brose (Gaelic *brothos*), Scottish dish. It is called water-B. or beef-B. according to whether it is made with water or meat-liquor. Milk can also be used, but whatever the fluid it is poured boiling hot on oatmeal, and the ingredients are mixed by instant stirring. 'Athole B.', a highland drink, is made of honey and whisky.

Brosley, par. now part of the municipal bor. of Wenlock, Shropshire.

Brosimum is a genus of Moraceae which grows in tropical America. The inflorescence is curious, consisting of one female and many male flowers, and the fruit is an achene. *B. galactodendron* is the cow-tree, or milk-tree, found in Guiana, which yields a milky latex. The fruit of *B. alocnistrum* is broad-nut.

Brosmius is a genus of fish of the cod-fish family, Gadidae. *B. brosme*, the torsk, is dried and barrelled in the Shetland Is.

Brosses, Charles de (1709–77), Fr. writer and scholar, the first president of the parliament of Burgundy. In 1750 he pub. the earliest work on the ruins of Herculaneum. In his *Histoire des navigations aux terres australes* (2 vols.), 1756, he was the first to define Australasia and Polynesia. Besides contributing to the *Encyclopédie*, and publishing an ingenious theory on the origin of language, he wrote some famous letters on Italy, and brought

out, in 1777, a hist. of the 7th cent. of the Rom. rep.

Broth, liquid food prepared by decocting meat with bone and vegetables in water. The ingredients are mixed together in cold water and brought gradually to the boil; they are then allowed to simmer gently for some hours, after which the liquid is strained off. The 'food value' of B. is not high, as the nourishing albumen and gelatin remain in the residue in an indigestible form; its usefulness lies in the fact that it is a stimulant and a relish. The B. itself contains creatin and some albuminous and gelatinous matter from the meat, and colouring and mucilaginous substances, a little albumen and volatile oils and salts from the vegetables.

Brothers, Richard (1757-1824), naval officer, *b.* Newfoundland, and educ. at Woolwich; famed more for his religious mania than his marine achievements. During his chequered career he became fired with the idea that he was 'the nephew of the Almighty.' He prophesied the death of the king and the end of monarchy, and was confined as a criminal lunatic. Later removal to a private asylum enabled him to produce many pamphlets which converted a few zealots. He foretold the violent death of Louis XVI. B. was one of the founders of the belief that the Eng. people represent the 10 lost tribes of Israel (*see* BRITISH ISRAELITES).

Brothers, Lay, professed religious who are employed as servants in monasteries. Similarly there are lay sisters. They are bound by monastic rules, but are not destined for holy orders. The earliest instance of L. B. occurred in the monastery of Vallombrosa, early in the 11th cent.

Brotton, *see* SKELTON and BROTTON.

Broutia is a genus of marine teleost fish which is a type of the family Broutiidae, order Percormorphi. It is distinguished chiefly by the dorsal and anal fins being united with the caudal. *B. barbatus* comes from the Antilles.

Brouage, Fr. seaside vil. in the dept of Charente-Maritime, once an important port, now silted up. Champlain (q.v.) was *b.* here. Pop. 250.

Brough, Lionel (1836-1909), actor, *b.* Monmouthshire, son of a dramatic author. B. was errand-boy in editorial offices of the *Illustrated London News* when about 13. His first appearance on the stage was in Dec. 1854; 6 months later he withdrew to become assistant publisher of the *Daily Telegraph* and soon after took a position on the *Morning Star*. He became a professional actor in earnest in 1864. Tony Lumpkin was one of his most noted characters. Among his Shakespeare parts were Sir Toby Belch, Touchstone, and the host of the 'Garter' in *The Merry Wives*. Other roles of his were Bumble in *Oliver Twist* and Brismouche in *A Scrap of Paper*. He appeared in Terry's *Sweet Nell of Old Drury*, 1901, and in *Into the Light at the Court*, 1908.

Brough, mkt tn of NE. Westmorland, England, 9 m. SE. of Appleby. There are ruins of a Norman castle; a great fair is held annually 2 m. away. Pop. 750.

Brougham, Henry Peter, Baron Brougham and Vaux (1778-1868), lawyer and politician, *b.* Edinburgh, and educ. at Edinburgh high school and Edinburgh Univ. where he was a scholar of great distinction. He was admitted to the Faculty of Advocates in 1800, but saw no hope of future preferment in a career at the Scottish Bar, and so in 1805 he came to London, entered at Lincoln's Inn, and in 1808 was called to the Eng. Bar. In 1802 the *Edinburgh Review* had been founded, and B. became one of its first and most capable contributors, so that by the time he arrived in London he was already well known. He speedily became prominent amongst the Whig politicians, and was employed on a diplomatic mission to Portugal during 1806. He produced also a great number of political pamphlets during 1807, and was of great help to the Whigs during that period. But his hopes of a seat in the Commons were still unfulfilled, and in 1808, after being called to the Eng. Bar, he joined the N. circuit. About this time he became an ardent supporter of the movement for the abolition of slavery, a movement with which his name will ever be closely associated. In 1810 he became a member of Parliament. In a very short time he had won for himself a considerable reputation as a speaker and politician, and was regarded by most people as the future leader of his party. From 1812 to 1816 he was out of Parliament, having been defeated at Liverpool, but it was during these years that B. became the adviser of the Princess of Wales. In 1816 he had again entered Parliament and did some useful work, especially on the committee which inquired into the state of education amongst the poor of London. But in 1820 he was appointed attorney-general for the queen, and conducted her defence when the ministers introduced a Bill for her deposition and for the dissolution of her marriage to George IV. He defended her ably, and the Bill was not taken any further by the ministers. His conduct of this case raised him high in his profession, and he shared in the triumph of the queen and the people over the court and the ministers. His reputation as a lawyer was now securely founded, and he was soon enjoying an immense practice on the N. circuit. In 1830 he was returned to Parliament as the member for York. The gov. under the Duke of Wellington, defeated shortly afterwards, resigned, and Earl Grey was sent for by William IV. In the Whig ministry that Grey formed B. was made lord chancellor, and created Baron B. and Vaux. The passing of the Reform Act was in a great measure due to the skill with which he defended the Bill, but with the passing of that Bill the authority of B. began to decline. His manner had been becoming dictatorial, he regarded himself as indispensable, and he probably used the *Edinburgh Review* to increase his influence and for self-glorification. In 1834 Grey resigned, and B. remained for a time with Melbourne. But his conduct was rapidly becoming too indiscreet, and his betrayal of the confidence of Melbourne

on the dismissal of the ministers was the finishing act of his official career. The formation of the second Melbourne ministry in 1835 did not lead to his re-appointment as chancellor, the seal being put in commission; B. never forgave the Whigs for this, and during the rest of his career he spoke as an independent member. In 1860 he received a second patent of peerage with remainder to his younger brother Wm, the patent setting forth that the peerage was given in recognition of his services to the cause of education, and in the movement for the abolition of slavery. He d. at Cannes, having been mentally ill during the last 2 years of his life. In addition to his reputation as a voluble speaker, he was also known by the amount of his writing and correspondence and his interest in law reform and popular science. He was one of the founders of London Univ. See his autobiography, pub. 1871, and life by C. T. Garratt, 1935.

Broughton, Baron, see HOSIHOUSE.

Broughton, Rhoda (1840-1920), novelist, b. Segrwyd Hall, near Denbigh, N. Wales, the daughter of the Rev. Delves Broughton. She came into prominence as a novelist of the popular type while still in her twenties, and continued to produce works of fiction for many years. Among her best-known novels are *Come up as a Flower*, 1867, *Not Wisely but Too Well*, 1867, *Red as a Rose is She*, 1870, *Joan*, 1876, *Belinda*, 1883, *Dear Faustina*, 1897, *Lavinia*, 1902, *Concerning a Vow*, 1914, and *A Fool in her Folly*, 1920.

Broughton-in-Furness, par. and mkt. tn. with railway station 9 m. SW. of Coniston, pop. 1136. Here is Broughton Tower with a superb view, now Lancs County Council School for Delicate Children.

Broughty Ferry, suburb of Dundee (q.v.) on the Firth of Tay, a resort with a sandy beach. Pop. 12,556.

Broumov (Ger. Braunau), Czechoslovak tn in the prov. of Hradec Králové (q.v.), on the Steine. Pop. 4600.

Broussa, see BURSA.

Broussais, François Joseph Victor (1772-1838), son of a physician, was b. St. Malo. After taking a medical degree in Paris, he served as an army surgeon, and in 1814 was appointed assistant prof. at the military hospital of Val-de-Grâce. About this time he introduced a theory of medicine, which asserted that life was sustained only by excitation or irritation, and that all diseases were at first local, but were made general by the 'sympathy' of the other organs. His views were explained in his *Examen de la doctrine médicale généralement adoptée*, 1816: they met with some acceptance at first but were eventually refuted. B. became prof. of general pathology at the Academy of Medicine in Paris in 1830, and d. at Vitry-sur-Seine.

Broussonetia is a dioecious tree of the family Moraceae. From the inner bark of *B. papyrifera*, or paper mulberry, the Chinese and Japanese manu. paper, and the S. Sea islanders the prin. part of their clothing.

Brouwer, Adriaen, see BRAUWER.

Brower, Jacob Vradenberg (1844-1905), Amer. explorer and archaeologist, b. York, Michigan. He served during the Civil war in both cavalry and navy, and was a member of the Minnesota legislature, 1867-73. B. discovered many prehistoric mounds at Mille Lac and other places in Minnesota. Among his works are *The Mississippi River and its Source*, 1893, *Prehistoric Man at the Head Waters of the Mississippi*, 1895, *The Mississippi River and its Utmost Source*, 1896, *Quivira*, 1898, *Harahey, Mille Lac*, 1899, and *Kansas, Monumental Perpetuation of its Earliest History, 1541-1896*, 1902.

Brown, Alice (1857-1948), Amer. authoress, b. Hampton Falls, New Hampshire. She was a prominent figure in Amer. literature over many years, belonging rather to the old school of New England writers who took New England life for their themes. Among her books are *Meadow Grass*, 1895, *Tavern Tales*, 1899, *The Story of Thyra*, 1909, *Homespun and Gold*, 1920. Her play *Children of Earth*, 1915, won the ten-thousand-dollar prize offered by Winthrop Ames, an Amer. theatrical producer.

Brown, Charles Brockden (1771-1810), Amer. novelist. His parents were Quakers of Philadelphia, where he was b. His delicate constitution favoured a retiring disposition and a capacity for study. His works are extremely terse in style and weird in conception, and include *Wieland*, 1798, *Arthur Mervyn*, 1799, *Ormond*, 1799, and *Edgar Huntley*, 1801.

Brown, Ford Madox (1821-93), painter. His father was a retired navy purser living at Calais, where B. was b. His grandfather, John B. (q.v.) founded the Brunonian theory of medicine. He was sent at the age of 14 to study art at Bruges. His prin. instructor was Baron Wappers, at Antwerp, who was regarded as the head of the Belgian school. He first exhibited in 1837, and 3 years later exhibited in England at the Royal Academy, the picture being 'The Gaiour's Confession.' In 1843 he took part in the competition for the mural decoration of the Houses of Parliament, and his pictures received very high praise but no prize. After some years of travel, he came in contact in London with D. G. Rossetti and the young Pre-Raphaelites (1848), being much influenced by their ideas. Among his chief works are 'Manfred on the Jungfrau,' 'Chaucer at the Court of Edward III,' 'Cordelia and Lear,' 'Christ washing Peter's Feet,' 'Work,' 'Romeo and Juliet,' 'The Last of England,' and historical panels for Manchester to hall. He was twice married, and left 3 children: Lucy, who married W. M. Rossetti in 1874; Catherine, who married Dr Haeffer; and Oliver, himself an artist, who d. in his twentieth year (1874). See *Pre-Raphaelite Diaries and Letters*, ed. by W. M. Rossetti, 1900.

Brown, Francis (1849-1916), Amer. O.T. scholar and theologian, b. Hanover, New Hampshire. Prof. of Heb. and the cognate languages (1890) and President (1908) of the Union Theological Seminary, New York. He also taught Greek, and

was the first Amer. scholar to teach Assyrian (in 1885 he pub. a little book on *Assyriology*). In 1884 he co-edited the newly discovered *Teaching of the Twelve Apostles*, but the lasting monument of his scholarship is the *Hebrew and English Lexicon of the O.T.* (ed. with Profs. S. R. Driver and C. A. Briggs), 1891-1906. He was the leader of the liberal Presbyterian group.

Brown, George (1818-80), Canadian politician, b. and educ. in Edinburgh; removed to New York in 1838, and was engaged in journalism. In 1843 he went to Toronto and founded there in 1844 the *Toronto Globe*. In 1852 he entered the Canadian Parliament, and in 1858 led a coalition gov. for a brief space of time. During 1864-5 he led the Reform section of the Coalition Gov., resigning on account of a difference of opinion regarding a reciprocity treaty with the U.S.A. In 1864 he was delegate to conferences at Charlottetown and Quebec, and in 1865 went on a mission to London. In 1873 he became a dominion senator, and in 1874 was joint Canadian plenipotentiary with Sir Edward Thornton at Washington. He was shot by a discharged employee in 1880. A man of unrestrained vehemence, he had excited Protestant suspicion of Quebec, and made himself one of the most hated men of his time.

Brown, George Douglas (1869-1902), novelist, b. Ayrshire. Educ. at Glasgow Univ. and Oxford, he started on his literary career in London. He pub. *Love and a Sword*, 1899, and his *House with the Green Shutters*, written under the pseudonym of George Douglas, attracted much notice, 1901. It represents some of the harder aspects of Scottish life, and is useful to contrast with the works of Barrie and Ian Maclaren. See E. Muir, *Latitudes*, 1924.

Brown, Henry Kirke (1814-86), Amer. sculptor, was b. Leyden, Massachusetts. After studying in Europe, he returned to his native country in 1846, and executed some notable works, including an equestrian statue of Washington in New York, and one of Gen. Scott in Washington.

Brown, Horatio Robert Forbes (1854-1926), historian, b. Nice; educ. at Clifton College and at New College, Oxford. In 1878 he visited Venice, and began studying its life and hist. His numerous contributions to Venetian hist. and literature include *Life on the Lagoons*, 1884, *Venice*, 1893, *In and around Venice*, 1905, *Studies in the History of Venice*, 1907, and *Calendar of State Papers* (covering the period 1581-1613), compiled 1894-1905. His life of John Addington Symonds, pub. 1895, was supplemented in 1923 by *Letters and Papers*.

Brown, Ivor John Carnegie (1891-), journalist and author, b. Penang. He was educ. at Cheltenham and Oxford, entered the Civil Service in 1913 but abandoned it for journalism, and was dramatic critic successively of the *Manchester Guardian*, the *Saturday Review*, the *Sketch*, and *Punch*. From 1942 to 1948 he ed. the *Observer*. In 1915 he pub. a novel, *Years*

of Plenty. Others of his works are *The Meaning of Democracy*, 1920, *Masques and Phases*, 1927, *Brown Studies*, 1930, and *I Commit to the Flames*, 1934. He also wrote books on *H. G. Wells*, 1922, and *Shakespeare*, 1949, and a number of small popular works on the meaning and etymology of out-of-the-way words: *A Word in Your Ear*, 1942, *I Give You My Word*, 1945, and others. In 1939 he was prof. of drama of the Royal Society of Literature, and from 1940 to 1942 director of drama for C.E.M.A.

Brown, John (1715-66), poet and playwright, b. Northumberland. Educ. at Wigan and Cambridge, he was known as 'Estimate Brown.' He made a clever defence of utilitarian philosophy in his *Essay on the Characteristics of Shaftesbury*, 1751. His *Estimate of the Manners and Principles of the Times*, 1757, which was a vehement satire on luxury and the like, was exceedingly popular, whilst his *Barbarossa*, 1754, was played with success by Garrick. An attack of melancholy, coupled with a hereditary tendency to insanity, accounts for his suicide.

Brown, John (1722-87), of Haddington, b. Carpow, near Abernethy, Perthshire, the son of a poor weaver. He lost both father and mother at an early age. He studied Greek, Latin, and Hebrew while working as a herd-boy. He served with the gov. forces in the '45, was a schoolmaster from 1747 to 1750, and became a pastor at Haddington in 1751. Refusing a call to New York in 1784, he continued to live at Haddington on a stipend of £40 or £50 a year until his death. In 1768 he was appointed prof. of theology to the Associate Burgher Synod. His works included *A Dictionary of the Holy Bible*, 1769, and *The Self-Interpreting Bible*, 1778.

Brown, John (1735-88), Scottish physician, was the founder of the Brunonian system of medicine. Being a lad of promise, he was admitted free to the lectures at Edinburgh Univ. In 1780 he pub. his *Elementa Medicinæ*, in which he explained a new system of treatment. Written in Latin—he was famous as a Latin scholar—this book gained him a worldwide reputation. The Brunonian theory attributed disease processes to a state of too great or too little excitability of the tissues; treatment resolved itself into stimulation if the excitability was lessened and soothing remedies if the excitability was too great.

Brown, John (1784-1858), son of John B. of Whithorn (1754-1832), and grandson of John B. of Haddington (q.v.). He studied at Edinburgh Univ. and the Burgher Theological Hall, Selkirk. He held successively the pastorates of Rose Street Church, Edinburgh (1822-9), and Broughton Place, Edinburgh. In 1830 Jefferson College, Pennsylvania, conferred upon him the degree of D.D., and in 1834 he was elected prof. of exegetical theology. He was engaged in many controversies, notably in the Atonement controversy of 1840-5. In 1845 he was tried for his views before the synod, but was honourably acquitted. He was a voluminous writer on religious subjects.

Brown, John (1800-59), one of the most famous of Amer. abolitionists, was *b. Torrington, Connecticut, 9 May, of Amer. colonial and revolutionary ancestors.* He was said to have been descended from a pilgrim on the *Mayflower*, and certainly displayed a stern religious spirit which bordered on fanaticism. He studied for a time for the Congregationalist ministry, but discontinued at the age of 18, and then led a wandering life, being at times a land surveyor and a sheep raiser, but was more or less a failure. He then tried farming in sev. of the E. states, and finally settled in Kansas in 1855, whither 5 of his sons had preceded him. A great struggle was then going on in the U.S.A., for as the middle and far W. were being opened up by settlers, the S. slaveholders were trying to secure them as ters. where slavery was allowed. The abolitionists on the other hand tried to make them 'free soil,' that is, localities where slavery was not permitted. Kansas was a battle-ground between the 2 hostile forces. B. soon took an active part in this contest, and was one of the leaders in the Pottawatomie massacre, in which a number of pro-slavery farmers were killed. This made B.'s name known all over the U.S.A., and it became anathema to the S. Meanwhile B. was planning to have a place in the Virginia mts where escaped slaves could find a refuge and defend themselves against their pursuers. To this end he settled on a farm near Harper's Ferry, in which tn there was located a gov. arsenal. To procure sufficient arms for his slaves' harbour of refuge, on 16 Oct. 1859, with 21 men, including sev. Negroes, he seized the arsenal and held a number of leading citizens of the tn as hostages. Gov. troops were quickly sent there, and by the irony of fate they were under command of Col. Robert E. Lee, who in the Civil war shortly to follow became Commander-in-Chief of the Confederate armies. B. was captured, but only after he had been badly wounded and 2 of his sons killed. This was on 18 Oct. He was put upon his trial and convicted of treason, murder in the first degree, and criminal conspiracy with slaves and was hanged at Charlestown 2 Dec. 1859. The verdict and execution were strictly legal, but they made of B. a hero in the N. He became a martyr, a latter-day saint, a legend. Only a few years later and N. troops were going into battle or marching through a beaten S., singing a song which immortalised B.'s name:

'John Brown's body lies a-mouldering in the grave,

But his soul goes marching on!'

Brown, John (1810-82), doctor and essayist, *b. Biggar, Lanark.* At Edinburgh Univ. he studied under the eminent surgeon Syme, to whose qualities his pen paid an affectionate tribute in later years. Conscientious and painstaking as a medical man, he was, at heart, more devoted to literature than to medicine, though always diffident of his literary powers. He wrote little, but wrote that little extremely well. His chief publs. were the

collection of essays known as *Horae Subsecivae*, 1858-82, and *John Leech*, 1877. In the latter he tells us that it was he who originated the first national exhibition of roses in London. He is chiefly remembered for his charming, quaintly written essays, among which *Rab and his Friends*, 1859, and *Marjorie Fleming*, 1863, are perhaps the best known. Except for 2 years at Chatham (1831-3) as assistant to a Scottish doctor, he spent all his life in Edinburgh, where he *d.* His letters, ed. by his son and D. W. Forrest, D.D., were pub. in 1907, with biographical introductions by Elizabeth T. McLaren.

Brown, Sir John (1816-96), steel and armour-plate manufacturer, *b. Sheffield,* son of a slater. At 14 he became an apprentice in a file and table cutlery manufactory, of which he ultimately became the manager. He invented the conical steel buffer for railway wagons, was the first to make steel rails, carried on and improved the Bessemer process, and invented a method of rolling armour-plate. Hammered armour-plate had been used hitherto, but B.'s method was so successful that he received orders from the Admiralty for armour-plate for about three-fourths of the ships of the navy. In 1856 he started the huge Atlas works for the manuf. of armour-plate, railway buffers, ordnance forgings, railway carriage axles and tyres, and steel rails. B. received a knighthood in 1867, and was much honoured in his native tn, of which he was twice mayor and master-cutler.

Brown, John (c. 1825-83), Queen Victoria's personal servant, was *b. Crathlie, Aberdeenshire,* second of the 9 sons of a small farmer. In 1849 he became gillie to Albert, the prince consort; in 1851 he began to lead the queen's pony when she went riding; and in 1858 he entered her service at Balmoral. For the last 19 years of his life he was her personal attendant and confidant.

Brown, Lancelot, known as 'Capability Brown' (1716-83), landscape gardener and architect, *b. Kirkcaldy, Northumberland,* was employed as a gardener in early life. He laid out the grounds at Kew and Blenheim. From c. 1740 to c. 1749 he collaborated with the architect Wm Kent (q.v.), the real father of landscape gardening; but from 1751 onwards he had a very large architectural practice, consisting mainly of country houses. In 1772 he took into partnership Henry Holland (q.v.), who married his daughter in 1773. See biography by D. Stroud, 1950.

Brown, Peter Hume (1849-1918), historian, *b. Tranent, E. Lothian.* He was educ. at the Free Church School, Prestonpans, becoming a pupil teacher. B. taught at schools in Wales and Newcastle upon Tyne, and opened a school at Edinburgh in 1875. In 1901 he was appointed Fraser prof. of anc. Scottish hist. and palaeography at Edinburgh Univ. and he was appointed historiographer royal for Scotland in 1908. His *History of Scotland* (3 vols., the last appearing in 1909) is still the standard hist. on the subject. B.'s other works include *George Buchanan and*

his *Times*, 1890, *John Knox, a Biography*, 1895, *Scotland in the Time of Queen Mary*, 1904, and *The Union of 1707, a Survey of Events*, 1907.

Brown, Robert (1773-1858), botanist, b. Montrose, and a schoolfellow of Joseph Hume and James Mill. He entered first the Marischal College, Aberdeen, and afterwards removed to Edinburgh Univ. His ability and his application attracted the attention of his prof. In 1795 he obtained a commission and served in the N. of Ireland. He became a protégé of Sir Joseph Banks, who gave him the post of naturalist in an expedition which was setting out to explore the coast of Australia. The expedition returned in 1805 to England with a rare collection of specimens numbering about 4000. In 1810 he pub. his greatest work, *Prodromus Florae Novae Hollandiae et Insulae Van Diemen*. In the same year he became private secretary to Sir Joseph Banks. The library and collection of Sir Joseph Banks were, on his death in 1820, bequeathed to B. for life. In 1827 he made them over to the Brit. Museum and became keeper of its botanical dept. He held this position until his death in 1858. He was F.R.S.

Brown, Thomas (1663-1704), satirical writer, b. Shifnal, Shropshire. He studied at Christ Church, Oxford, where he is said to have escaped expulsion by extemporizing the famous verse:

I do not love thee, Doctor Fell,
The reason why I cannot tell;
But this I know, and know full well,
I do not love thee, Doctor Fell;

Dr Fell, dean of the college, having set B. the task of extemporizing a trans. of Martial's epigram, *Non amo te, Sabidi, nec possum dicere quare; Hoc tantum possum dicere, non amo te*. B. was for a time a schoolmaster near London, in which city he afterwards lived by his pen. His writings are numerous and miscellaneous, and, while witty, are coarse and frequently vulgarly abusive.

Brown, Thomas (1778-1820), Scottish metaphysician, b. Kilmarnock, and educ. at the univ. of Edinburgh, where he attended the lectures of Dugald Stewart, prof. of moral philosophy. He abandoned his arts course for medicine, becoming doctor of medicine about 1803, and in 1806 a partner with Dr James Gregory. Resigning his practice in 1810 in order to assist Dugald Stewart, he became a popular lecturer, holding the position until his death. He wrote many poems of no outstanding worth, but his philosophical works show great merit and power of analysis, although now little known. His pubs. include *Observations on the Zoonomia of Erasmus Darwin*, 1798, *An Inquiry into the Relation of Cause and Effect*, 1805, and *Lectures on the Philosophy of the Human Mind*, 1820.

Brown, Thomas Alexander, see BOLDREWOOD, ROLF.

Brown, Thomas Edward (1830-97), poet and schoolmaster, b. Douglas, Isle of Man. Educ. at King William's College and Christ Church, Oxford, he took a double first and became a fellow of Oriel. After

a short period as a headmaster at Gloucester, he accepted the headmaster of Clifton's (Dr Percival) offer of the position of master for the modern side. He pub. a number of poems and collections of poems, the chief of them being in the Manx dialect, amongst which may be mentioned, *Poet's Lyrical*, 1881, *The Doctor and other Poems*, 1887, *The Manx Witch*, 1889, and *Old John*, 1893. His collected poems were pub. in 1900, and his letters were ed. in the same year. See T. E. Brown, *A Memorial Volume*, 1930.

Brown, see PIGMENT.

Brown, Mount, peak in the Rocky Mts. on the frontiers of Brit. Columbia, and near the source of the Columbia R. Height 9055 ft.

Brown Bess, name (obsolete since the introduction of the rifle) given by the infantry of the Brit. Army to the flintlock musket used by them from the late 17th to the early 19th cent. See also FIREARMS.

Brown-Séguard, Charles Edward (1817-1894), doctor and physiologist, b. in Mauritius. His father was an American in the naval service, and his mother a Frenchwoman, but he always wished to be known as a Brit. subject. He took his medical degree at Paris in 1846, and returned to Mauritius intending to practise there; however, he went from there to America in 1852. He attracted considerable attention by his lectures on the pathology of the nervous system. In 1864 he became prof. of physiology at the univ. of Harvard, and 5 years later he returned to Paris as prof. of pathology in the School of Medicine there. Later, in 1873, he set up in New York as a practitioner and a nerve specialist, but again returned to Paris when, in 1878, he became the prof. of experimental medicine in the Collège de France. He remained in this position until his death. His experimental work was of the greatest importance in the development of our knowledge of internal secretions (hormones, q.v.) and of the nervous system. See life by J. M. D. Olmsted, 1946.

Brown-shirts, see S.A. and S.S.

Brown Spar, variety of dolomite containing carbonate of iron. Its colour inclines to red or brown. The term is sometimes applied to examples of ankerite, siderite, and brannerite.

Brown University, at Providence, Rhode Is., was founded on a non-sectarian basis by Philadelphia Baptists in 1764, as Rhode Is. College. It assumed its present name in 1804, honouring a substantial benefactor, Nicholas Brown. The Univ. Library contained 825,000 vols. in 1956; the renowned John Carter Brown Library 30,000 items of Americana. The separate women's college, added in 1891, has borne the name Pembroke College since 1928; with 147 students in 1955, it has the same teaching staff as B. U. The univ. teaching staff numbered 500 in 1955; students, 3400.

Brown Willy, the highest point (1375 ft) in Cornwall, England. It is 10 m. NE. of Bodmin.

Browne, Charles Farrar, pseudonym Artemus Ward (1834-67), Amer. humorist,

b. Waterford, Maine, son of an engineer. He learned the printing trade and worked for various country newspapers, his earliest literary production, 'The Surrender of Cornwallis,' appearing in the *Boston Carpet Bag* in 1852. The first of the Artemus Ward series appeared in the *Cleveland Plain Dealer* in 1858, and embodied the fiction that B. was a traveling showman of waxworks and tame animals. In the following year he joined the staff of *Vanity Fair* in New York, and his contributions were collected as *Artemus Ward: His Book*, 1862. President Lincoln enjoyed his work, and opened the fateful cabinet meeting which resulted in proclaiming freedom for slaves in 1862 by reading out B.'s 'High Handed Outrage in Utica.' Going on a lecture tour, B. worked through California and Nevada to Salt Lake City, then returned to New York, where he lectured on 'Artemus Ward among the Mormons.' In 1866 he sailed for England, where he made the Savage Club his H.Q., and contributed to *Punch*, but d. in Southampton of consumption. Like other Amer. humorists, B. secured his comic effects partly by pretended illiteracy, bad spelling, and atrocious puns. His complete works appeared in 1871. See E. P. Hingston, *The Genial Showman*, 1870, and life by D. C. Seitz, 1919.

Browne, Edward Granville (1862-1926), orientalist, son of Sir Benjamin C. B., shipbuilder, of Newcastle upon Tyne. Educ. at Eton and Cambridge, he studied medicine at Cambridge and in London, but devoted himself chiefly to the study of Persian. Travelled in Persia, 1887-8. Pubs. include trans. from Persian; also *A Year amongst the Persians*, 1893 and 1926 (including a memoir in the 1926 ed.) and a *Literary History of Persia* (4 sections), 1902-24.

Browne, Edward Harold (1811-91), bishop, b. Aylesbury, and educ. at Eton and Cambridge. He was a fellow and tutor of Emmanuel College. In 1843 he became vice-principal of Lampeter College, and was later appointed Norrisian prof. of divinity at Cambridge. In 1850-1853 appeared his famous book, the *Exposition of the Thirty-nine Articles*, a book which was for a long time the standard work on this subject and which ran into many eds. He became Bishop of Ely in 1864, and was one of the most prominent churchmen of the time. In 1873 he was trans. to Winchester, which see he resigned owing to ill health in 1890.

Browne, George, Count de (1698-1792), soldier, b. Camas, Limerick, in Ireland. On completing his studies at Limerick, he entered (1725) the service of the elector palatine, since, as a Catholic, he was excluded from many appointments in his own country. From Germany he passed into the Russian Army, where he quickly distinguished himself. After successfully quelling a revolt against the Empress Anna, he took an active part in the wars against Poland, France, and Turkey. His whole life was full of adventure: he was taken prisoner by the Turks, and sev. times sold as a slave. Later he fought in

the Seven Years War, and was wounded at Zorndorf. He was made major-general and then field-marshal by Peter III. For the last 30 years of his life he was governor of Livonia and Estonia.

Browne, Hablot Knight (1815-82), illustrator, best known by his pseudonym 'Phiz.' He was b. of poor parentage at Lambeth. He received what artistic training he had during his apprenticeship to Finden, the steel engraver. He succeeded Seymour as illustrator of Dickens's *Pickwick*, and his visualisation of Dickens's characters has become inseparable from them. He was the creator of the Sam Weller which all readers of Dickens know, and amongst other very successful creations of his may be mentioned Mrs Gamp, Tom Pinch, Maj. Bagstock, Micawber, and David Copperfield. He signed his drawings 'Phiz' to match Dickens's 'Boz.' He executed some drawings for *Punch*, and did most of the illustrations for Lever's works and some for Harrison Ainsworth, producing also some water-colours. In 1867 he had a stroke causing slight paralysis, after which he did no more really successful work. In 1878 he was awarded a pension by the Royal Academy. See F. G. Kitton, *Phiz*, 1882.

Browne, Maximilian Ulysses (1705-57), descendant of an Irish Jacobite family, b. Basel. His father and uncle were 2 of the exiles of 1690, his father entering the Austrian service and becoming ennobled, whilst his uncle entered the Russian service and became a field-marshal. He himself entered the service of Austria at a very early age, and was rapidly advanced. He took part in the 11 campaigns of the Austrian Army and distinguished himself also whilst fighting against the Turks. He was early in the field during the war of the Austrian Succession (1740-8), and it was owing to his efforts in the field that the success of Frederick the Great was restrained. At the end of the war he was promoted to the rank of commander-in-chief of the army of Bohemia, and in 1753 he became a field-marshal. He was still an active officer when the Seven Years War (1756-63) broke out, and he took an active part in the early campaigns. He commanded the Austrians at the battle of Lobositz (1756), where he was defeated, but retreated in good order. He was mortally wounded at the battle of Prague.

Browne, Robert (c. 1550-1633), founder of the Brownists, b. Tolethorpe, near Stamford, of an ant and well-known family. Educ. at Corpus Christi College, Cambridge, he was for a time a schoolmaster. He took orders, but his licence to preach was revoked when he began to attack and condemn the Estab. Church. So fiercely did he denounce its gov. that he was imprisoned in 1581 by order of the Bishop of Norwich, and only released through influence. After sev. imprisonments he retired to the Netherlands and formed a church, which was not very successful and soon broke up. Meanwhile, in his *Booke which sheweth the Life and Manners of all True Christians*, he put forward the theory on which modern Congregationalism has been built up.

After some years at Middelburg, he returned to Britain and stayed for some time in Scotland. He then returned to his home, and tried to spread his doctrines there. He again suffered imprisonment, but his attitude towards the Estab. Church changed, and he accepted a position at St Olave's Grammar School, and finally became vicar of a church in Northants. Here he stayed 43 years, but always a man of violent temper, he was in 1630 imprisoned for an assault on a constable, and died in jail. His defection did not break up his sect. They survived in the Netherlands for a considerable time, and many migrated to America. In England they took the name of Independents or Congregationalists.

Browne, Sir Thomas (1605-82), author and physician, *b.* London, son of a merchant. He was educ. at Winchester and Pembroke College (then known as Broad-gates Hall), Oxford, after which he studied medicine at continental univs., including Leyden, where he graduated. After prolonged travel abroad, he finally, in 1634, settled in practice at Norwich. His claim to renown rests on his *Religio Medici* (written, according to authentic tradition, at Shipden Hall, Halifax, an old house and park since somewhat rudely encroached upon by industry), pub. (though not designed for pub.) in 1642, but probably written in 1634 or 1635, though his *Hydriolaphia, or Urne Buriall* (pub. 1658) probably displays best the peculiar force of his genius and the old-world flavour of his majestic style. His other chief work, *Inquiries into Vulgar Errors* (more fully *Pseudodoxia Epidemica, or Enquiries into very many commonly received Tenets and commonly presumed Truths, which examined prove but Vulgar and Common Errors*), was pub. in 1646. He is, indeed, one of the most original of Eng. writers. Whilst civil war devastated the country, he was serenely absorbed in metaphysical speculation on the mysteries of life. His work is steeped in the mysticism of Plato, so that he beholds the world merely as an image, and he seems to look on all things rather in the spirit of the modern transcendentalist. Introspective and sceptical though he was, his 'religion of a doctor' is thoroughly impregnated with the feeling of the essential mystery underlying true religion. His other writings are *The Garden of Cyrus, or the Quincuncial, Lozenge, or Network Plantations of the Ancients, Artificially, Naturally, Mystically Considered*, 1658, *Certain Miscellaneous Tracts* (mostly addressed to Sir Nicholas Bacon), 1683, and *Christian Morals*, 1716. Knighted in 1671 on account of his royalist sympathies in the Civil war. He married in 1641, and the mild scorn expressed in the *Religio Medici* for that 'trivial and vulgar way' of union does not appear to have prevented him and his wife Dorothy from enjoying an exceedingly happy married life. He *d.* at Norwich. The best ed. of the complete works is that by Simon Wilkin, 4 vols., 1836 (3 vols. (Bohn), 1851), where full biographical and bibliographical information will be found. Prefixed to it is

Johnson's famous *Life*. See also 6-vol. ed. by G. Keynes, 1928-31; life by Sir E. Gosse, 1905; R. Sencourt, *Outlying Philosophy*, 1925.

Browne, William (c. 1590-c. 1645), poet, *b.* Tavistock, Devon. He was educ. at the grammar school there, from which he went to Exeter College, Oxford, and afterwards was entered at the Inner Temple. He is said to have been received into the household of Wm. Earl of Pembroke, but little is known of his later life. His poems, which are mainly descriptive, are rich and flowing, and true to the scenes he depicts, but lack deep feeling. They show the influence of Spenser, and B. in turn had some influence on such poets as Milton and Keats. His chief works were *Britannia's Pastorals*, 1613-16, *The Shepherd's Pipe*, 1614, and *The Inner Temple Masque*, 1615. He was the author of the famous epitaph on the Countess of Pembroke, long attributed to Ben Jonson, beginning 'Underneath this sable hearse.' There are eds. of his works by W. C. Hazlitt, 1868-9, and G. Goodwin, 1894. See also F. W. Moorman, *William Browne*, 1897.

Browne, William George (1768-1813), traveller, was fired to explore by reading Bruce's *Travels*. In 1792, after careful examination, he concluded that the ruins at Siwah were not those of the temple of Jupiter Ammon. Though later he journeyed through Syria, Asia Minor, and the Levant, his most important expedition (1793-6) was to Darfur, when he acquired trustworthy information as to the Nile's course. He was murdered by bandits, it is said, whilst travelling towards Teheran. A dry, affected style spoils his *Travels in Africa, Egypt, and Syria*, 1799.

Brownell, William Cray (1851-1928). Amer. critic. He was educ. at Amherst College and for 2 years (1879-81) was art critic to the *New York Nation*. From 1890 onwards he acted as literary adviser to the publishing house of Charles Scribner. His first book, a sympathetic study of France, called *French Trails*, appeared in 1889, but with the pub. of *French Art* in 1892 he firmly estab. his position in the profession of criticism. He wrote a series of incisive studies of the Victorian and Amer. 'prose masters,' which appeared in 1901 and 1909 respectively. Other books are *Newport*, 1896, *Criticism*, 1914, *Standards*, 1917, *The Genius of Style*, 1924, and *Democratic Distinction in America*, 1927.

Brownhills, urb. dist. in Staffs, England, in the Cannock parl. div., with important coal-mines; near the Essington Canal and on the Rom. Watling Street. Pop. 21,480.

Brownian Movement, name given to a phenomenon discovered by Robert Brown, a botanist, in 1827. On viewing through a microscope a liquid such as gamboge solution, in which small particles are in suspension, these particles are seen to be in constant motion backwards and forwards without any regularity or co-operation. Brown suspected living matter, but it has been shown by Gouy and Perrin that the phenomenon would follow from

the molecular structure of matter, being produced by molecular bombardment, arising from thermal motion. In 1905 Einstein arrived at a satisfactory quantitative theory. The phenomenon is closely related to sedimentation equilibrium in an emulsion of very small particles. An equilibrium is reached in which the density of the particles decreases gradually with increasing height.

Brownie, in the folk-lore of Scotland a goblin of the most obliging kind. He was never seen, and was only known by the good deeds which he did. He usually attached himself to some farmhouse in the country, and he was only noticed by the voluntary labour which he performed during the night. He would churn, or thresh the corn, or clean all the dairy utensils, or perform some equally good-natured labour. The country people had great faith in the good works of the B. and believed in him implicitly. His reward was usually a dish of cream. The B. bears a strong resemblance to Robin Goodfellow in the English and the Kobold of Ger. literature, whilst some comparison can be made between him and the household gods of the Romans and the Russian domovoy. B.s were often the cause of the mysterious disappearance of things, and in this respect can be compared to the pixies of SW. England. Practically every known folk-lore has its special fairy which can be compared to the B.

Brownies, see GIRL GUIDES.

Browning, David Clayton (1894-), author and journalist, *b.* Glasgow. He was educ. at Glasgow and Oxford Univs. and was leader-writer for the *Glasgow Herald*, 1925-31. He has since specialised in compiling literary works of reference, including *Everyman's English Dictionary*, 1942, *Dictionary of Quotations and Proverbs*, 1951, *Dictionary of Shakespeare Quotations*, 1953, and *Dictionary of Literary Biography: English and American*, 1958. He also revised and modernised Rogge's *Thesaurus*, 1952.

Browning, Elizabeth Barrett (1806-61), poetess, *b.* Carlton Hall, Durham. The greater part of her life was spent in Herefordshire, at a place called Hope End. Suffering from injury to her spine, for many years she was under the shadow of threatened consumption, and frequently experienced family bereavements, circumstances which affected her style of writing in no small degree. Among these bereavements was the death by drowning of a brother, the witnessing of which gave her a shock the effect of which never left her. A helpful influence was that of her husband, Robert B., the poet, whom she married in 1846 against the wishes of her family. Previous to this she had pub. sev. literary works. In 1826 appeared *An Essay on Mind*, and other Poems. Her trans. of Aeschylus's *Prometheus Bound* was pub. in 1833 and *The Seraphim* in 1838, while during this period she contributed to the *Athenaeum* and other periodicals. In 1844 appeared an issue of *Poems*, in 2 vols., and a new, greatly enlarged ed. in 1850. The first of these vols. contained the poem *Lady Geraldine's*

Courtship, leading to her acquaintance with her future husband. The marriage proved an ideal one, and Mrs B. was restored to comparative health by her residence in Florence, where the only child of the marriage was *b.* In 1852 appeared *Casa Guidi Windows*, Italian in setting and sentiment. *Aurora Leigh* in 1856 was a long 'sociological' romance or 'novel in verse' and proved a distinct departure from her previous work. In the *Poems before Congress*, 1860, her husband's influence was plainly discernible. She *d.* at Florence in 1861, and in the next year a vol. of *Last Poems* was issued. It has been said that Mrs B.'s popularity was



ELIZABETH BARRETT BROWNING

assured when her husband's was still problematical. Certain it is that up to the pub. of *The Ring and the Book* she was by far the better known. Her easy style, incoherent and fatally voluble though she might be occasionally; her interest in her own time, as exemplified in *The Cry of the Children*; her romantic tendency which sometimes leads her into 'gush,' as in the *Rhyme of the Duchess May*—all these combined to make her peculiarly acceptable to the reading public at large. She has been called the greatest Eng. poetess, but her work, though musical and metrically beautiful, is so marred by her inability to understand the value of rhyme sounds, that as an artist she is inferior to Christina Rossetti. She certainly is the most voluminous poetess, and has impressed her character best upon her work. Her supply of words is extraordinary, and she has a wonderful power of pathos. She is at her best in lyrical work; with the exception of one or two pieces, practically all her other writing might with advantage be compressed. In the *Sonnets from the Portuguese*, 1850, which were addressed to her

husband, we have work of such exquisite beauty that it bears comparison in tone, sentiment, and execution with some of the best in our language. There are many of the shorter pieces of whose beauty much might be said. Her faults, if obvious, are but blemishes; and the jewels of her work are to be ranked for ever as precious stones and set in the casket of our literature. Eds. of her works are innumerable. Collections of her letters were pub. in 1897, 1929, and 1954. See *lives or studies* by J. H. Ingram, 1888; K. E. Royds, 1912; J. C. Willis, 1928; J. C. Clarke, 1929; D. Hewlett, 1953; also D. Creston, *Andromeda in Wimpole Street*, 1932, and Virginia Woolf, *Flush, a Biography*, 1933.

Browning, John Moses (1855-1926), inventor of small arms, b. Ogden, Utah, son of Jonathan B., a gunsmith and a member of the Mormon community. His name is a household one in connection with numerous small arms, especially automatic. His breech-loading single-shot rifle was patented in 1879 and bought by the Remington Co. His next patented designs were those for his repeating rifle, 1884, and the Colt machine-gun, which later was accepted by the U.S. Army. It was in 1895 that B. patented his box magazine. Perhaps his best-known weapon is his 'B. pistol,' which was manuf. at Liège in large quantities and much used in the First World War. During that war the war dept of the U.S.A. held a test of guns, the result being that a new weapon, designed by B. and capable of firing nearly 40,000 rounds before suffering a breakage, was adjudged the best. It was also during the First World War that B. designed an automatic rifle weighing no more than 15½ lb., this design also being adopted by the U.S. Army. Both B. automatics were used by U.S. troops in the Second World War. The Winchester and Stevens sporting rifles and other types of sporting weapons were also B.'s designs. See also FIRE-ARMS.

Browning, Oscar (1837-1923), writer and historian, b. London. He was educ. at Eton and King's College, Cambridge, becoming fellow and tutor of his college. In 1860 he became a master at Eton, and later a univ. lecturer in hist. at Cambridge. He took a prominent part in univ. movements, including those for univ. extension and the training of teachers; he aroused enthusiasm for the study of political science and modern political hist. Three times he stood unsuccessfully for Parliament as a Liberal. Among his contributions to modern hist. are *England and Napoleon in 1803*, 1887, *The Flight to Varennes*, 1892, *A History of the Modern World, 1818-1910*, 1912; and to lit. hist.: *Dante: his Life and Writings*, 1891, *Guelphs and Ghibellines*, 1893, *The Age of the Condottieri*, 1895. See also his *Memories of Sixty Years*, 1910, and *Memories of Later Years*, 1923.

Browning, Robert (1812-89), poet, b. Camberwell. His father was an important official in a bank, and his mother, whose maiden name was Wiedemann, was of Scottish-Ger. descent. Robert never

devoted himself to any profession, being first and last a man of letters. His education was not that of the ordinary young Englishman of means, but was privately obtained. During his youth he was noted for his passionate devotion to literature and music, and his intellectual promise was always considered great. Yet, while Tennyson successfully wore down all criticism, and perhaps increased his renown by the acceptance of the laureate's crown, B. had to struggle against the storm of adverse opinion for nearly 40 years before his worth was fully recognised. The essential defects of the poet, as they are generally and perhaps unjustly called, are seen in equal measure in his late and early work. He himself dismissed *Pauline*, 1839, as unworthy of inclusion among his later works. It is a study in autobiographical form of the development of a soul through many adverse experiences to final peace, and it is a difficult poem because the causes of the successive mental states are unexplained. *Paracelsus*, 1835, an imaginative reconstruction of the physician's life, has more of beauty and of interest. Here we get the breathlessness of hurried simile crowding against simile, which later gave rise to much of the criticism of his work on the score of obscurity; but here also are the peculiarly rapid blank verse and his original lyric form. In 1837 he wrote a drama, *Strafford*, at the request of Macready, who produced it at Covent Garden (1 May 1837), but he was more felicitous in using the dramatic form without much thought of practical application to the stage, as, for example, in *Pippa Passes*, a dramatic fantasy based on the idea of unconscious influence. He was interested less in the conflict of a group of characters than in the fortunes of a single mind; and to give this psychology something of objectivity he invented the 'dramatic monologue,' as exemplified in *Fra Lippo Lippi*, *Andrea Del Sarto*, and *Saul*. His other avowed dramas are *King Victor and King Charles*, on an episode in the annals of the house of Savoy; *A Blot in the 'Scutcheon'*, a strong domestic drama, but overcharged with narrative; *The Return of the Druses*, a 5-act tragedy on the tyranny of the knights of Rhodes; *Colombe's Birthday*, on true love's triumph over worldly ambition; *Luria*, dramatising a fictitious episode in the 15th-cent. struggle between Florence and Pisa, the interest being essentially psychological. In 1840 appeared the poem *Sordello*, the tale of an obscure Mantuan troubadour mentioned by Dante, in which, once again, the real interest is in the development of a soul, though the 'dramatic' background is concerned with the struggles of Guelphs and Ghibellines and of emperor and pope. *Bells and Pomegranates*, a series of 8 pamphlets issued between 1841 and 1846, included *Dramatic Lyrics*, 1842, and *Dramatic Romances and Lyrics*, 1845. In 1846 B. married Elizabeth Barrett, the poetess, and for the sake of her health removed to Florence. The marriage proved an ideal one; he speaks again and

again of his wife in reverent, loving verse. 'My perfect wife,' he calls her. During this period he produced *Christmas Eve and Easter Day*, 1850—companion poems, dealing, the one with evangelicalism, Rom. Catholicism, and rationalism, the other with the essentials of Christian faith and practice—and *Men and Women*, 1855, which, like his previous *Dramatic Lyrics*, 1842, and later *Dramatis Personae*, 1864, exploit, with considerable success, his device of the 'dramatic monologue'; in all these will be found some of his best work, particularly in the last-named. After Mrs B.'s death, which occurred in 1861, B. returned to London, and gave himself up to work. In 1868-9 appeared *The Ring and the Book*, a huge poem of more than 20,000 lines, which was more than favourably received. It is based on an old MS. B. read in Italy, telling of the murder of a girl-wife by her nobleman husband. The tale is told and retold by each one of the actors, and wonderful art is used in the differentiation of the various characters. The poem is remarkable for its dramatic power and variety, but still more for its boundless humanity and a sustained psychological perception which can have rarely been equalled in poetry. Having at last gained attention, B. let few of the next 15 years pass without at least one or two vols. from his pen. These included *Balaustion's Adventure*, 1871, founded on an incident in Plutarch and embodying a 'transcript' of the *Alcestis* of Euripides; *Prince Hohenstiel-Schwangau*, 1871, a study of Napoleon III; *Fifine at the Fair*, 1872, an inquiry into the relations of men and women in which casuistry and truth concerning uncertainty in love are strangely blended; *Red Cotton Night-cap Country*, 1873, and *The Inn Album*, 1875, both melodramas of modern life; *Aristophanes' Apology*, 1875, a sequel to *Balaustion's Adventure*, introducing *Heracles*, another 'transcript' from Euripides; *Pacchiarotto and how he worked in Distemper*, 1876, in which B. makes an ineffective and not very dignified attack on his critics; a trans. of the *Agamemnon* of Aeschylus, 1877; *La Saisiaz*, 1878, inspired by the death of a friend, Miss A. E. Smith; *The Two Poets of Croisic*, 1878, a narrative poem, concluding on the note that happiness must be the final test of poetic merit; *Dramatic Idylls*, 1879-80, and *Jocoseria*, 1883, in both of which B. returns to the method of *Dramatic Lyrics*; *Ferishah's Fancies*, 1884, a dozen fables, ascribed to a dervish, expressing B.'s religious and moral views, followed in each case by a lyric interpreting its lesson in more emotional terms; *Parleyings with Certain People of Importance in their Day*, 1887, a series of critical character studies; and *Asolando*, 1889, a final miscellany remarkable for its fine 'Epilogue,' summing up B.'s characteristically optimistic outlook. The greater part of these are written in the curious blank verse which he now affected, and are all marked by the blemishes which even his greatest admirers cannot deny he exhibited in his work. Yet in these appear some of his loveliest

lyrics, and indeed it can be affirmed that *Asolando*, which was pub. almost on the same day on which his death took place in Italy, contains work as beautiful in form and thought as that in his *Dramatis Personae* of a quarter of a cent. earlier. Any estimation of the value of B.'s work must be made more difficult by the fact that towards the close of his life he received an adulation which was as unwise in its attitude as unsuited to his dignity. From the formation of the now defunct Browning Society in 1881 his adherents formed themselves into a kind of defensive and offensive alliance, ready to accept all his doings as good, and to challenge the world on his behalf. Most unwisely, they gave colour to the often reiterated charge of obscurity laid against the poet, by producing handbooks to his works, and even a cyclopaedia to all B. references. Such blind devotion defeated its own ends by making the general reader suppose that B. was 'difficult,' and so led to comparative neglect. But following the long period of uncritical neglect and of an equally uncritical cult, which rendered impartial judgment almost impossible, there is clear evidence to-day that, while much of his voluminous writing will be allowed to fall into oblivion, what survives will be accounted among the permanent treasures of modern literature—not least some of his lyrics, such as 'The Last Ride Together,' 'Prospice,' and 'Love among the Ruins,' which are noble examples of his art. Though so much of his work is concerned with medieval Italy, yet he is essentially the Englishman in Italy, patriotic in heart, although by choice cosmopolitan. He is, again, the poet of the It. Renaissance, and seems to have caught the very spirit of it; witness the cruel beauty of 'My Last Duchess' or the grotesque pathos of 'The Bishop orders his Tomb,' to choose only 2 out of many. His interest in art and music is probably a result of early inclination, and his later surroundings. In his attitude towards nature it may be taken generally that, like Wordsworth, he gives her a personality but, unlike him, considers that personality distinct from, and usually hostile to, the human. But it is in his dramatic lyrics and monologues that he is most often at his greatest. Such pieces as 'The Last Ride Together,' 'Rabbi Ben Ezra,' and 'Holy Cross Day,' will be remembered when his more ambitious works of greater length lie forgotten. Through them we see the poet himself hopeful always, tolerant of others, and believing, God being in His heaven, that the best was yet to be. There are few poets who so unconsciously disclose themselves in their works. B.'s ethical teaching is strenuous and militant—life is to be faced boldly and not evaded. B.'s views of poetry and art faithfully reflect these ethical principles and in them unite high spirituality with the frankest acceptance of the natural world (e.g. in *Fra Lippo Lippi*). From the beginning to the end of his long literary career, B. proclaimed God, immortality, and the goodness of

things, and if, none the less, he emphasises the ugliness and evil of the world, he does so in order to prove that the basis of faith remains unshaken even in the worst conditions. It has been well said that B.'s own life had been, in the best sense, fortunate, so that he knew little of the evil which, in the abstract, fascinated him, and had he known more of life he might have come to realise evil as a fierce and positive corruption in human life, and that realisation would have deepened his poetry. See lives by W. Sharp, 1890; A. Waugh, 1903; G. K. Chesterton, 1903; E. Dowden, 1904; W. H. Griffin and H. C. Minchin, 1910 (revised ed., 1938); Fanny Browning, *Some Memories of Robert Browning*, 1928. See also A. Orr, *A Handbook to the Works of Browning*, 1885, 1887; A. Symonds, *An Introduction to the Study of Browning*, 1886, 1906; W. R. Inge, *The Mysticism of Robert Browning*, 1906; F. Rhys, *Browning and his Poetry*, 1914; B. Miller, *Robert Browning: a Portrait* 1952.

Brownists, see BROWNE, ROBERT.

Brownsea, is. in the entrance of Poole harbour, Dorset. Also known as Branksea. On it are a Gothic church and a Tudor castle.

Brownson, Orestes Augustus (1803-76), Amer. philosopher and theologian, was b. Stockbridge, Vermont. He was in turn a Presbyterian, a Universalist, an Independent, a Unitarian, and a Rom. Catholic. He wrote strongly and with great fervour on all the theological and philosophical questions which agitated his times. He founded the *Boston Quarterly Review*, 1838, and *Brownson's Quarterly Review*, 1844. His chief works were *Charles Elwood, or the Infidel Converted*, 1840, a book in which he strongly supported the Rom. Catholic Church, and *The American Republic: its Constitution, Tendencies, and Destiny*, 1865. See A. M. Schlesinger, *Orestes A. Brownson*, 1939.

Brownsville, co. tn of Cameron co., Texas, U.S.A., on the Rio Grande, 25 m. from its mouth in the Gulf of Mexico. In 1846 there was a notable bombardment of a small U.S. force which had occupied the place. The Amer. Army defeated a superior number of Mexicans near here. Pop. 36,000, of whom many are Mexicans.

Brownwood, city in Brown co., Texas, U.S.A. Pop. 20,000.

Broxburn, vil. of W. Lothian, Scotland, 6 m. SE. of Linlithgow, and adjoining Uphall (q.v.), chiefly known for its shale oil works. Pop. (with Uphall) 9530.

Bruay-en-Artois, Fr. tn in the dept of Pas-de-Calais. It is an important coal-mining tn. and has brewing, glass-making, and sugar refining. Pop. 31,700.

Bruce, Sir David (1855-1931), military physician, b. Melbourne, Australia. Educ. at Stirling High School and Edinburgh Univ. Entered R.A.M.C. 1883. Assistant prof. of pathology, Netley, 1889-94. In 1899, fellow of Royal Society, for which he undertook commissions of inquiry into diseases in Malta, Uganda, and Nyasaland. In Malta he discovered the cause of Malta fever (brucellosis), and in Africa

he showed that the tsetse-fly was the carrier of the organism causing sleeping-sickness or trypanosomiasis. He was knighted in 1908. In the First World War he was chairman of the pathological committee of the War Office. President Brit. Association, 1924.

Bruce, Edward (c. 1549-1611), Scottish lawyer. He accompanied King James to England on his accession, having, in 1601, by his diplomacy opened up the famous correspondence between his master and Sir Robert Cecil.

Bruce, James (1730-94), explorer of Africa, b. Stirlingshire, and educ. at Harrow and Edinburgh Univ. He studied for the Bar, but entered the wine business on marrying the daughter of a wine merchant. The sudden death of his wife, within less than a year of their marriage, led to his travels in Spain and Portugal. He examined some E. MSS. in the Escorial, and his enthusiasm led to the adoption of his career as an explorer. He was selected as Brit. consul of Algiers, and given a commission to study the anot remains there. In 1765 he explored the ruins of Barbary, and travelled to Tripoli and thence to Candia. He subsequently travelled through Syria, staying at Palmyra and Baalbek. He reached Alexandria in 1768, and successfully accomplished a long-cherished dream, the discovery of the source of the Blue Nile in 1770. His *Travels to Discover the Source of the Nile*, 1790, shows familiarity with Lat. and Gk texts, and in this he is to be compared with James Silk Buckingham (q.v.). The scepticism with which his account was received in London proved a great disappointment, and he retired to his estate at Kinnaird. Though a man of notorious vanity, he recovered from his pique sufficiently to publish an account of his travels in 1790, and though the expert criticism of its authenticity was then strong, the main facts have since been corroborated, notably by Lt.-Col. Playfair. His unfinished autobiography was pub. in part in the (1805, 1813) eds. of the *Travels*.

Bruce, James Robert Thomas, see ELGIN, EARLS OF.

Bruce, Michael (1746-67), poet, b. Kinrosswood, Kinross-shire, son of a poor weaver. His education was seriously hampered by his interrupted attendance at school, for he was often required to act as herdsman. Circumstances proved sufficiently kind to allow his subsequent entry into Edinburgh Univ. for 4 sessions, and for a short time he kept a school. His longest poem, *Locheven*, written in spite of broken health, shows the influence of James Thomson. His best poem is his *Elegy written in Spring*. His promising career was cut short by consumption in 1767. The authorship of the famous 'Ode to the Cuckoo' beginning 'Hail, bonetuous stranger of the grove' is contested, some ascribing it to B., others to his editor, the Rev. John Logan, but the evidence is strongly in favour of B.'s claim.

Bruce, Robert (1274-1329), King of Scotland. The B.s were of Norman

origin, and B.'s grandfather, with John Balliol, had claimed the Scottish throne in 1290. On the death of his father in 1304, B. became 6th lord of Annandale. At the beginning of his career he supported Edward I, hoping, probably, to secure his father's accession to the Scottish throne. As Earl of Carrick he swore fealty to the Eng. monarch at Berwick, and in 1297 renewed his oath at Carlisle. Shortly after this, however, he served under Wallace (q.v.), but after the capitulation of Irvine he was again at peace with Edward. In 1298 he rebelled once more, and burned the castle of Ayr, whilst 5 years later he fought on the Eng. side, during the siege of Stirling. From then onward, however, B. vacillated no longer; he was soon to become prime champion of Scotland's independence. His secret alliance with Lamberton, Bishop of St Andrews, undertaken as a means of defeating Edward's ambitious projects, was an important step in his career. Of all the clergy, Lamberton had been the most loyal supporter of Wallace, and was therefore, after his meeting with B., a firm bond of union between the 2 leaders in the national movement. But the turning-point in B.'s career was the murder of the Red Comyn, in 1306, on the high altar of the church of the Friars Minor, Dumfries. B. had probably made some compact with Comyn, who was Balliol's nephew, as to their respective claims to the throne. While they were together in the church, a violent quarrel ensued, in the course of which B. fatally stabbed his rival. Hastening to Lochmaben Castle, B. gathered his adherents together, and 2 months later was crowned king by the Bishop of St Andrews at Scone. He now had to reckon with both the English and the Comyn party. In June 1306 he was surprised by the Earl of Pembroke, Commander-in-Chief of the Eng. Army, in Methven wood, and had to seek refuge in the moors of Athole. Two months later he suffered a second defeat, near the head of Loch Tay, at the hands of the Comyn's uncle, lord of Lorn. Leaving his queen at Kildrummy Castle, Aberdeenshire, he was obliged to lead a wanderer's life in the W. Highlands, until he managed to escape to the is. of Rathlin (off Antrim, Ireland). Many tales survive of the hairbreadth escapes of B. and of his courage throughout all difficulties. Meanwhile his friends at home gave him up for dead, and Edward proceeded with his work of vengeance. B.'s lands were confiscated and he and his followers were excommunicated. But B.'s days of hardship and defeat were nearly over. Early in 1307 he landed at Carrick, and though he was forced for a time to take refuge in the hills of Ayrshire, he rallied his forces, and at Loudon Hill subdued the English under the Earl of Pembroke. His final success was assured by the death, in 1307, of his formidable adversary, King Edward. By 1311 B. was in possession of all the great castles, with the exception of Stirling. And this stronghold, too, fell into his hands after his memorable defeat of the English at Bannockburn (1314), in

which his superior generalship deprived the enemy of their huge numerical advantage. In 1318 B. captured Berwick, which was henceforth a Scottish, instead of an Eng., frontier tn. On the accession of Edward III, the Scots made wide incursions into the N. countries, but the treaty of Northampton (1328) ended hostilities. By its chief clause 'Scotland shall remain to Robert, King of Scots, and his heirs, free and undivided from England, without any subjection, servitude, claim, or demand whatsoever.' The last 2 years of B.'s life were passed at Cardross Castle, on the Firth of Clyde. He d. of leprosy, which he had contracted during his campaigns. On his death his heart was extracted, embalmed, and given to Sir James Douglas, who was to have carried it to Jerusalem, but he d. whilst fighting the Moors in Spain. The relic was finally deposited in the monastery of Melrose, whilst B.'s body was buried in the abbey church, Dunfermline. B. is remembered as Scotland's national hero. He had undoubted military genius, and possessed a strength of character and an ability to inspire devotion which brought him loyal followers even in moments of complete defeat. See life by Agnes Mure MacKenzie, 1934.

Bruce, William Speirs (1867-1921), Scottish explorer and geographer, son of Samuel Noble B., an Edinburgh surgeon. In 1892 he went out as naturalist of the *Balaena*, one of a little fleet of 4 ships bound for the Antarctic and the adjacent seas. This Dundee whaling expedition went out to look for the commercially valuable Greenland whale. But the Royal Society and the Meteorological Society equipped the fleet with scientific instruments, and appointed officers to undertake the work of observation and research. In 1902 he was the leader of an expedition of which he wrote a report: *The Scottish National Antarctic Expedition—Scientific Results of the Voyage of the S.Y. 'Scotia' during the Years 1902-4*. On this expedition he discovered Coats Land. In 1911 he issued *Polar Exploration*. His later studies were chiefly of Spitzbergen, which he had visited at the end of the last cent., and which he revisited 1906, 1912, 1914, and 1919. His obituary appeared in the *Scottish Geographical Magazine*, vol. xxxviii, Jan. 1922.

Bruce of Melbourne, Stanley Melbourne Bruce, 1st Viscount (1883-), Australian statesman, was b. Melbourne (Victoria), son of John Bruce, and was educ. at Melbourne Grammar School, and at Trinity Hall, Cambridge. He was called to the Bar in the Middle Temple in 1907; but soon afterwards became a partner in the Australian importing firm of Paterson, Laing & Bruce. He served in the First World War as an officer of the Royal Fusiliers; was wounded at Suvla Bay, and again in France; and, having been awarded the Military Cross, was invalided, and returned to Australia in 1917. In 1918 he entered the Commonwealth Parliament as member for Flinders. In 1921 he represented Australia at the League of Nations Assembly, and became

Commonwealth treasurer; second-in-command to Wm Morris Hughes, the Prime Minister—an ex-member of the Labour party, who had formed a National party, to which B. adhered as a member of the Liberal wing. In 1923 on the resignation of Mr Hughes, B. became Prime Minister and minister for external affairs, forming a coalition of the National and Country parties. He was in London in 1923, and was made a privy councillor. He also attended the Imperial Conference of 1926. He added to his duties those of minister of health, 1927–8, and of minister of ters., 1928–9. In 1929, having been frustrated in his efforts to work the Commonwealth Labour Arbitration Law, he introduced a Bill to abolish the federal jurisdiction in arbitration cases. He was outvoted on this measure, the opposition being led by his former chief, Mr Hughes, and was heavily defeated at the ensuing general election, being succeeded as premier by the Labour leader, Mr Scullin. Became resident minister in London in the late Joseph Lyons's first Cabinet, 1932, and, later, high commissioner for Australia in London. President of the Council of the League of Nations, 1936. His long term of office as high commissioner for Australia in London was not ended until 1945. Since 1947 B. has been chairman of the Finance Corporation for Industry. Raised to the peerage after the war.

Brucea, genus of shrubs of the Simarubaceae, named in honour of James Bruce, 1730–94 (q.v.), the traveller in Ethiopia, and is said to be a tonic and an astrigent; the leaves and seeds of *B. sumatrana* are intensely bitter and possess the same medicinal properties.

Bruch, Max (1838–1920), Ger. composer, b. Cologne. His early teaching was by his mother. He won the Mozart Prize at Frankfurt and then studied under Hiller and Reinecke at Cologne and afterwards became a music teacher there. His first opera was a setting of Goethe's *Schmerz, List und Rache* (Cologne, 1858); his second, *Lorelei* (Mannheim, 1863). Later he went to Berlin where he wrote an indifferent opera, *Hermione*, on Shakespeare's *Winter's Tale* (1872). He resided in England from 1880 to 1883 and was for a time conductor of the Liverpool Philharmonic. In 1893 he was made director of the Hochschule in Berlin. His reputation in Germany rested chiefly on such works as *Frithjof*, 1864, for male chorals and orchestra and *Odysseus*, 1872, for mixed chorus and orchestra; but he was best known in England for his works for violin or cello with orchestra, of which the G minor Violin Concerto is the most famous, others being *Kol Nidrei* for cello and the *Scottish Rhapsody* for violin.

Bruchsal, Ger. tn in the Land of Baden-Württemberg (q.v.), 35 m. NW. of Stuttgart (q.v.). It has a famous baroque castle (badly damaged in the Second World War), once the residence of the prince-bishops of Speyer (q.v.), and there is also a fine baroque church. The tn is an important centre of communications. Pop. 18,500.

Bruchus is the typical genus of the coleopterous family Bruchidae. The females deposit their eggs in the seed-cases of leguminous plants, and the matured larva feeds on the seeds, and may thus do much damage. *B. pisi* is a native of Britain which devours peas, *B. fabae* beans, and *B. granarius* vetches and beans.

Brucine ($C_{22}H_{33}O_4Na$), vegetable alkaloid found in company with strychnine in nux vomica and false Angostura bark, from which latter it was first isolated in 1819 by Pelletier and Caventon. B. is a tertiary base closely allied with strychnine, but is more soluble in alcohol and water, is less bitter, and has a much less poisonous effect on the system. The anhydrous alkaloid melts at 178°. The crystalline form is prismatic and contains ordinarily 4 molecules of water. It turns a bright red colour with nitric acid, which yields nitro-derivatives, and at the same time acts as an oxidizing agent.

Bruck: 1. Austrian tn in the prov. of Lower Austria, on the Leitha. It has a fine castle and anc. houses. Pop. 8300.

2. Tn in Switzerland (see Brugg).

Bruck an der Mur, Austrian tn in the prov. of Styria. It has interesting old buildings, and manufs. iron, paper, and cables. Pop. 12,000.

Brückenaue, Ger. spa in the Land of Bavaria, 170 m. NNW. of Munich (q.v.). There is also a spa at Bad B., 3 m. distant in the valley of the Sinn. Pop. 7000.

Brucker, Johann Jakob (1696–1770), Ger. historian of philosophy. He was a native of Augsburg, and was educ. at Jena Univ., where he graduated in 1718. In 1723 he became par. minister of Kaufbeuren, and 8 years later was elected a member of the Academy of Sciences at Berlin. His chief work is *Historia Critica Philosophiae*, 1742–4, which attained immediate success. His other works, now little known, include *Oltum Vindelicum*, 1731, and *Erste Anfangsgründe der philosophischen Geschichte*, 1751.

Bruckner, Anton (1824–96), Austrian composer, son of a vil. schoolmaster, was destined for a teaching career, but was taught the organ; and at the age of 13, when his father d., he went as chorister to the monastery of St Florian, where he received more systematic training in music. He composed much while filling various teaching posts, but it was not till the age of 31 that he was appointed organist at Linz Cathedral. He took a severe course of study under Sechter during visits to Vienna, another in orchestration and form under Kitler at Linz, and only at the age of 40 did he write his first mature work, the Mass in D minor. In 1868 he became prof. at the Vienna Conservatory, in 1869 he visited France, and in 1871 England as organ virtuoso. In 1878 he was appointed to the court chapel, but he was never comfortably off to the end of his life and his works made headway very slowly. He wrote a vast amount of sacred and secular choral music on a small scale, but little else, even for the organ; his important works are his Masses and *Te Deum*, the

string Quintet, and particularly his 9 symphonies which, though desultory in form, show his greatness by grandeur of conception, splendour of orchestration, and expansive melodic beauty. He was too easily induced by his professional friends to revise, cut, and rescure the symphonies, with the result that various versions exist to confuse students and to provoke endless quarrels among experts.

Bructerus, Mons, see BROCKEN.

Brudenell, James Thomas, see CARDIGAN, EARL OF.

Brueghel (Breughel), Pieter the Elder (c. 1529-69), Flem. painter and founder of the family of that name, which became famous for painters. *B.* at Brueghel, near Bruges, he was the son of a peasant. He worked in early life as engraver, afterwards travelling fairly extensively in France and Italy. He became a member of the academy of Antwerp about the year 1551 and *d.* in Brussels. His work is distinguished by its humour and satire, being somewhat influenced by Bosch (q.v.), though in such works as 'Peasant Dance' he shows a great individual genius. His son Pieter (1564-1638) is known as *Hell B.*, because of the weirdness of the subjects which he usually chose to paint. Another son, Jan (c. 1568-1625), known as *Velvet B.*, is noted for his studies of still life and for his landscapes and seascapes. He travelled extensively in Italy, living for some time there. He painted parts of the landscapes of some of Rubens's pictures.

Brueys, David Augustin de (1640-1723), Fr. theologian and dramatic author. *B.* early abandoned his career as a lawyer, and gave himself up to theological controversy. He was converted by Bossuet from Protestantism to Catholicism, became a priest, and wrote now chiefly with the object of converting Protestants. An ardent frequenter of the Comédie-Française, *B.* soon began to write plays himself, generally in collaboration with Jean Palaprat, so as to avoid publishing in his own name. He gained his reputation chiefly as the author of *Le Grondeur, Sol toujours soi,* and *L'Avocat Patelin*. This last comedy (an adaptation of a medieval farce) gave rise to the adjective *patelin*, applied to a person who tries to gain his ends by flattery and fine words.

Bruges, Roger of, see ROGIER VAN DER WEYDEN.

Bruges (Flem. Brugge), the city of bridges, cap. of the prov. of W. Flanders, Belgium, situated about 60 m. NW. of Brussels and 8 m. from the N. Sea, at the junction of sev. important railways and canals. The tn still keeps its medieval appearance to a very great extent, and the effect of this is added to by the retention of its old city walls and its medieval fortified gates, making of *B.* the most picturesque tn of Belgium. The old city is remarkable for the antiquity and grandeur of its old Gothic buildings. In particular 2 of its Gothic buildings, both of which date back to the 14th cent., may be mentioned, the cathedral of St-Sauveur and the church of Notre-Dame. The cathedral still has

a magnificent appearance, though it was much damaged by fire in 1839, and contains a number of interesting and valuable pictures. The church of Notre-Dame contains the tomb of Charles the Bold and of his daughter Mary of Burgundy, and has also a collection of marble statues, one of which, the 'Virgin and Child,' is by Michelangelo. Amongst other buildings of interest which may be mentioned are the Halles (market-hall) with a Gothic belfry and the most magnificent chimneys in Europe, the Palace of Justice, and the Hôtel de Ville. The chief manu. of the tn is lace, which gives employment to a very great number of people. Other



THE GOTHIC BELFRY OF BRUGES

manufs. are linen, woollen, and cotton, yeast, bristles, embroidery, and printing. By means of its canal communications it can trade with a number of the ports of Europe, and in particular mention may be made of the ship canal to Zeebrugge, which has opened up and developed the trade with Hull. The foundation of *B.* goes back to before the 7th cent., and the tn owes its name to the fact that the city originated at a bridge (*brug*) over an inlet of the sea. The spot was first fortified by Count Baldwin of the Iron Arm, who made it his chief residence. By the 12th cent. it was recognised as the most important tn in, and the cap. of, Flanders, and it was here that the various counts were proclaimed. During the 13th and 14th cents. *B.* claimed equal place with Ghent, and was the recognised centre of the Hanseatic League (q.v.) in middle N. Europe. Its commerce was developed along wise lines, and it speedily assumed, and for some time kept, the premier position amongst the trading tns of Europe.

The order of the Golden Fleece was instituted here by Philip the Good in 1430. In the 15th cent. it rose up in revolt against the Duke of Maximilian, and the measures of repression which were adopted gave the first severe blow to the trade of the city. Its pop. at this time probably exceeded 200,000. The decline was completed by the persecution of Alva and Philip II; and additionally by the silting up of the estuary on which the city was

1523. The par. church of B. dates from 1480.

Brugmansia, genus of solanaceous shrubs now included in *Datura* (q.v.). *B. arborea*, Angel's Trumpet, a Peruvian shrub, is *Datura arborea*; *B. knightii*, Mexico, is *D. cornigera*; and *B. sanguinea*, Peru, is *D. sanguinea*; all grow outdoors in mild dists.

Brugsch, Karl Heinrich (1827-94), eminent Egyptologist, was the son of a



Belgian Embassy

BRUGES: THE TOWN HALL

situated. Many of the traders and merchants fled the tn, and its prosperity rapidly declined. It was captured by the French in 1794, and became part of the United Netherlands in 1815. Later, in 1830, it became a part of the kingdom of Belgium. It was occupied by the Germans during the 4 years of the First World War, but little damage was done to it. It was again occupied by the Germans from 1940 to 1944. In 1942, when the Germans organised a defensive line along the coast 12 m. deep, the city became crowded with refugees from the coastal belt. The pop. is (1955) 51,700.

Brugg, small tn in the canton of Aargau, Switzerland. In the museum are many relics of the Rom. camp Vindonissa. The large mental hospital of Königsfelden has taken the place of the abbey, dissolved in

cavalry officer, and was b. Berlin. The patronage of Frederick William IV enabled him to visit the prin. museums of Europe, and he first went to Egypt in 1853, being sent there by the Prussian Gov. He there made the friendship of Mariette, the Fr. archaeologist, and joined him in his excavations at Memphis. He was for some time prof. of oriental languages at Göttingen; afterwards (1870) became director of the school of Egyptology at Cairo. Among his chief works were *Geographische Inschriften altägyptischer Denkmäler*, 1857-60, and *Geschichte Ägyptens unter den Pharaonen*, 1877.

Brühl, Heinrich, Count von (1700-63), chief minister and favourite of Frederick Augustus II (otherwise known as Augustus III), King of Poland and elector of Saxony, b. Weissenfels. Beginning life

as a page in the service of the Duchess Elizabeth of Saxe-Weissenfels, he became Prime Minister to Augustus II in 1746, and aided and abetted that monarch in all his extravagant ways. He played fast and loose with the finances of the country to such an extent that when the Seven Years War broke out, Augustus could only send a small force to meet Frederick of Prussia, and his army was hopelessly beaten by Frederick at Pirna. His library of 62,000 vols. now forms part of the library at Dresden.

Brühl, Ger. tn in the *Land* of North Rhine-Westphalia (q.v.), 28 m. S. by E. of Düsseldorf (q.v.). It has a fine 18th-cent. rococo palace, and has coal and iron industries. Pop. 30,000.

Brun, Cornelius, *see* BRUYN.

Bruise, extravasation of blood into the tissues from small blood vessels ruptured by injury. When a B. occurs in the superficial tissues the familiar discoloration, together with slight swelling, is to be seen shortly after the injury, disappearing gradually and changing colour as the blood pigment in the B. disorganises. As a rule an injury which breaks the skin does not cause a B., since the bleeding is then external and not into the tissues. Internal B. causes no visible signs, but the patient is conscious of discomfort in the affected part. In more severe types of injury correspondingly larger blood vessels may be ruptured and the extravasated blood forms into localised collections which are absorbed gradually or may have to be evacuated. These collections of blood are known as haematomata.

Brulov, or Brylov, Constantin Karl Pavlovich (1799-1852), Russian painter, b. St Petersburg and d. at Marciano, near Rome. He studied Raphael in Rome, and on his return to Russia was appointed painter to the court, and in 1836 prof. at the St Petersburg Academy. His huge 'The Last Day of Pompeii' had a sensational success in Russia and was praised beyond its merits by Gogol and Pushkin.

Brumaire ('foggy month'), second month of the Fr. revolutionary calendar, estab. in France in 1793. The 18th B. (of the year VIII), corresponding with 9 Nov. 1799 of the Gregorian calendar, was the day on which Napoleon overthrew the Directory and replaced it by the Consulate. *See* CALENDAR.

Brumath (Rom. *Brocomagus*), Fr. tn in the dept of Bas-Rhin. The forest of B. is a favourite resort of the Strasburg townsfolk. Vines are grown. Pop. 5700.

Brummell, George Bryan (1778-1840), dandy, known as 'Beau Brummell,' b. in London. He was educ. at Eton and Oriel College, Oxford, and a few years later, upon inheriting a fortune of £30,000, he gave himself up to the pleasures of society in London. He attained notoriety for his taste in dress, though that, while elegant and precise, was never extravagant. For many years he enjoyed the patronage of the Prince of Wales (afterwards George IV), but they quarrelled in 1813, and soon afterwards gambling losses drove him to France. He lived at Calais

for 14 years, and then (1830) was appointed consul at Caen. A few years later he sank into imbecility, and d. in the asylum of Bon Saurvoir, Caen. *See* life by V. Woolf, 1930. *See also* W. Connely, *The Reign of Beau Brummell*, 1940.

Brun, Charles Le, or Lebrun, *see* LE BRUN.

Brun, Cornelius, *see* BRUYN.

Brun, Marie Louise Elisabeth Vigée le, *see* LEBRUN.

Brun, Rudolf, Swiss magistrate, d. in 1360. He headed an insurrection in his native tn of Zurich, had himself proclaimed dictator, and prevailed upon the people to establish a new constitution. These events led to his becoming the first burgomaster of Zurich. After a long struggle with the deposed magistrates the Emperor Louis of Bavaria persuaded him to receive a pension and a sum of money in exchange for which he made peace.

Brunanburh, site of a battle in 937 in which Athelstan and his brother Edmund defeated a powerful alliance consisting of Norsemen and the Kings of Scotland and Strathclyde. B. has never been identified, and has been variously placed in dists. as far apart as Dumfriesshire and Lincs. As a result of this victory Athelstan became the first king to reign undisputed over all England. A ballad vividly commemorating the victory is in the *Anglo-Saxon Chronicle*; Tennyson used this as the basis of one of his poems. *See* A. Campbell, *The Battle of Brunanburh*, 1938.

Brunck, Richard François Philippe (1729-1803), Fr. classical scholar, was b. Strasburg, and educ. at the Jesuits' College, Paris. As military commissary he participated in the Seven Years War. He pub. many eds. of the Gk classics, the first being the *Anthologia Graeca*, in which his innovations on the conventional mode of criticism, startled European scholars. He took part in the revolution, lost his pension, and was imprisoned at Besançon.

Brundisium, *see* BRINDISI.

Brupe, Guillaume Marie Anne (1763-1815), Fr. marshal, b. Brives-la-Gaillarde, Corrèze. He commenced studying for law in Paris, and later became a journalist. His friendship with Danton was begun here and also his alliance with the Jacobins. He took part in the military operations of the 13th Vendémiaire as a brigadier-general. He served under Napoleon in 1796, and 2 years later commanded the Fr. Army in Switzerland. Against the Anglo-Russian attack on Amsterdam in 1799 he won a complete victory. On Napoleon's adoption of the imperial title in 1804 he was appointed marshal. In Aug. 1815 he was murdered by the royalists.

Bruneau, Alfred (1857-1934), Fr. musical composer, b. Paris. He studied under Massenet, and took second Prix de Rome at Paris Conservatoire. Best known as a writer of dramatic music, he produced his first opera in 1887; *Le Rêve*, which followed in 1891, was not only generally praised but notable as a work which strongly influenced the development of the modern Fr. school. Opinion is divided on

the merits of his later work, some critics regarding his technique as rather crude. The libretto of *Le Rêve* was written by Louis Gallet after Zola's novel, and after that B. worked in close co-operation with Zola, basing sev. operas, including the best, *L'Attaque du moulin*, 1893, on his work and inducing him to write 3 librettos himself: *Messidor*, 1897, *L'Ouragan*, 1901, and *L'Enfant-roi*, 1905. He was music critic to *Le Figaro*.

Brunel, Muslim sultanate situated on the NW. coast of Borneo. It is a Brit. protected state. Area about 2226 sq. m., with a coastline of 100 m., lying between 4° 2' and 5° 3' N. lat. and 114° 4' and 115° 22' E. long.; pop. 48,000. Under Brit. administration since 1906. The chief tn bears the same name as the sultanate and has a pop. of 12,000. The only other tn of any size is Kuala Belait at the SW. end of the state's seaboard. Climate, hot and moist with cool nights. The interior is largely jungle with much timber of value. Rainfall varies between 100 and 200 in. for different parts of the state. B. is the largest producer of crude petroleum in the Commonwealth after Canada. Oil was first found in 1914, but there was no production on a commercial scale until 1932. Crude oil exports in 1955 were worth nearly \$41,000,000; a part went to Sarawak for refining. Other exports are rubber, firewood, and a little cutch; rice is grown for local consumption. Local crafts include the manu. of silverware and brassware and the weaving of silk and cotton sarongs. The B. silversmiths are perhaps the most famous of the Malay Archipelago. The forests of B. represent one of the greatest potential assets of the state, but are not exploited at present. There are 2 wireless stations. The state has an interesting and somewhat varied hist. A state named Puni, 45 days' sail from Java, is mentioned sev. times in the annals of the Sung dynasty, which ruled over S. China AD 960-1280, and it is practically certain that the reference is to B. In the 14th cent B. owed allegiance to Malacca. By the 16th cent. it had risen to great power and, in the reign of Sultan Bolkia, its authority extended not only over the whole of the is. of Borneo, but also over the Sulu Is. and part of the Philippines. The first European account of B. is that of Pigafetta, who sailed with Magellan on his famous voyage round the world. Pigafetta saw B. in 1521 and was greatly impressed by the splendour of the court and the size of the tn. Towards the end of the 16th cent. the power of B. began to decline and by the middle of the 19th cent. it had fallen hopelessly into decay. By a treaty made in 1888 B. was placed under the protection of Great Britain, and in 1906 administration was entrusted to a Brit. resident; the governor of Sarawak is high commissioner for B.

Brunel, Isambard Kingdom (1806-59), son of the equally famous engineer, Sir M. I. B. (q.v.), b. Portsmouth. At a very early age he showed the possession of those qualities which are essential to a good engineer and draughtsman, and he

was sent at the age of 14 to the Collège Henri Quatre in Paris to study. Three years later he entered his father's office, and in 1831 his plans for the Clifton suspension bridge were adopted, and he was put in charge of the work. The bridge, however, was not completed until after his death, owing to lack of funds, but his plans were strictly adhered to, and the chains of the Hungerford suspension bridge were used in its construction, since that bridge, erected by him in 1841-5, had been superseded by the Charing Cross railway bridge in 1862. From 1833 to 1846 he was the chief engineer of the G.W.R.; here he achieved many triumphs, especially in his construction of canals. In addition to his work as a railway engineer, B. also constructed the first steamboat which made regular voyages between America and this country; this was the *Great Western*, which he constructed for the railway company of that name. He was also the designer of the *Great Britain*; his greatest achievement was the construction of the *Great Eastern*, but he only lived long enough to see her get afloat, and did not witness the beginning of her great voyages. The *Great Eastern* started on its first voyage on 7 Sept. 1859, and on 15 Sept. the great engineer d. In addition to his railway and ocean steam navigation work he also helped in the construction of many docks throughout the country. His skill and ability were generally recognised throughout England, and he was made a F.R.S. and an hon. D.C.L. of Oxford.

Brunel, Sir Marc Isambard (1769-1849), inventor and engineer, b. Hacqueville in Normandy. He was originally intended for the church, but showed a natural ability for mathematics and mechanics, and ultimately joined the navy. With the navy he served for some 6 years, until, on returning to France in 1792, he found the revolution at its height, and being a pronounced royalist, he left the country for the U.S.A. Here, in 1793, he began his career as an engineer. He became chief engineer for New York, and erected a new arsenal for the city, fitting it with some ingenious machinery for boring of his own invention. He sailed for England in 1799, and submitted some plans for making ships' blocks, which were ultimately accepted by the gov. His machinery saved the gov. a considerable amount of money in the first year's working, and he was appointed to carry out many other plans for the gov. at various dockyards. He made experiments in steam navigation, and advised the gov. to adopt steam tugs for taking warships out to sea, but in 1814, after some actual experiments, the gov. refused to adopt the idea. In 1821 he became a bankrupt owing to his financial mismanagement and also owing to the fire which destroyed his sawmills at Battersea. His chief claim to fame—and he has many—is the part which he played in the construction of the tunnel under the Thames. The start was made in 1825; the riv. broke through the roof twice, once in 1827 and again in 1828. The work was

discontinued in the latter year, and was not again taken up until 1835, the tunnel being finally opened in 1843. Together with his son, I. K. B. (q.v.), he made many experiments. Knighted in 1841, and in 1829 received the order of the Legion of Honour.

Brunelleschi, Filippo (1379-1446), It. architect, b. Florence. To him a revival of the Rom. style is largely attributed. His natural taste for craftsmanship altered his father's intention of arranging for him to follow the profession of notary, and he was accordingly apprenticed to a goldsmith, where he quickly mastered all that was to be learnt. Unsuccessful with a design for the Baptistry gates in Florence in 1401, he then went to Rome to study ancient buildings. Returning to Florence in 1407, he submitted a competitive design for the completion of the cathedral there with a cupola. In this competition he was successful, but the execution of his design did not begin till 1419, and the lantern on the cupola was not erected until after his death. His other buildings, all in Florence, included the churches of S. Lorenzo, 1425, and S. Spirito, 1433; the Pazzi Chapel, c. 1420; the Ospedale degli Innocenti, 1445; and the Pitti Palace, begun 1435.

Brunetière, Ferdinand (1849-1906), Fr. author and critic, b. Toulon. He began to write for the *Revue des deux mondes* in 1875, and became its editor in 1893. From 1886 to 1895 he was prof. of the Fr. language at the Ecole Normale; during this time, too, he lectured with great brilliance, chiefly on Fr. literature. An event in B.'s life—his conversion from materialism to Catholicism—caused an immense sensation throughout France. He was a leader of the conservative critics. Although at first a follower of the evolutionist theory, he later attacked the scientific approach to literature. Among B.'s most important works are *Le Roman naturaliste*, 1883, *Études critiques sur l'histoire de la littérature française*, 1886-1907, *L'Évolution des genres dans l'histoire de la littérature*, 1890, *L'Évolution de la poésie lyrique en France au XIX^e siècle*, 1894, *Nouveaux Essais sur la littérature contemporaine*, 1895. In *Le Roman naturaliste* he wages war against the Fr. realist or naturalistic writers, especially those of the school of Zola.

Brunhilda: 1. In the *Nibelungenlied*, Queen of Iceland (Isenlant), wooed by Siegfried for the King of Burgundy, Günther. Kriemhild, sister of Günther, and wife of Siegfried, excites the envy of B., whose friend, Hagen, one of Günther's followers, discovers the vulnerable point in Siegfried's enchanted body, treacherously slays him, and steals the Nibelung hoard and buries it in the Rhine. In the original Norse legend B. was the beautiful daughter of Odin, who, having disobeyed his orders, was cast into a deep sleep on the rock of Hengartjell and guarded by a wall of fire. Here she had to remain until a hero, daring all for her sake, penetrated the wall and freed the 'warrior woman.'

2. A princess of the Visigoths. The

daughter of the Visigothic king, Athanagild, she was married to Sigbert, King of Austrasia. She was cruelly put to death in 613.

Bruni, Leonardo (1369-1444), It. scholar, b. Arezzo, from which place he obtained the name of Leonardo Aretino by which he is often known. In 1405 became papal secretary, and held the position for 10 years under 4 consecutive Popes. He then went to Florence, where he gained the friendship of the Medici family and through them the state chancellorship in 1427, which he held until his death. He did much to advance Gk learning in Italy, particularly by his trans. into Latin of the works of Demosthenes, Plutarch, Aristotle, and Plato. His *History of Florence* was first pub. in 1610.

Bruniaceae, family of dicotyledonous shrubs, natives of S. Africa. The flowers are hermaphrodite, arranged in whorls of 5, with either 2 or 3 united carpels containing sev. ovules, or with a single carpel containing 1 ovule. The fruit is a capsule or a nut. Genera include *Berzelia*, *Brunia*, *Lincoxia*, *Raspalia*, *Staaria*, and *Thamnea*.

Brünig Pass, over the Swiss Alps, joining Meiringen and Luzern. It is about 3400 ft at its highest point. In 1889 a railway was opened up, which was electrified in 1941.

Brünig, Heinrich (1884-), Ger. statesman and economist, b. Münster. He was educ. at Munich, Strasburg, Münster, and Bonn Univs., and later served in the First World War. After the war he became secretary to Stegerwald, founder of the Catholic trade union movement and Prussian minister for social welfare, and in 1924 he entered the Reichstag. In 1929 he was elected par. leader of the Catholic Centre party—a victory of the anti-Socialist right wing. When, in 1930, Hindenburg accepted him as chancellor of the Reich, B. was the youngest man who had ever held that office. It was a time of acute financial crisis, and B. resorted to rule by emergency decrees owing to the inability of any party to provide a working majority in the Reichstag. He attempted to reach agreement with Hitler, but he was fundamentally anti-Nazi, and as the Nazi influence grew, Hindenburg withdrew his support from B., who resigned, 1932. Though his gov. led directly to the Nazi assumption of power, there is no doubt that B. personally was a conscientious chancellor of Christian principles and sincere intentions, who, however, lacked the vital capacity to control events. He left Germany soon after Hitler gained power, lecturing at Oxford, and then going to live in the U.S.A. He returned to Germany after the Second World War, to become prof. of political science at Cologne Univ. (1951).

Brunings, Christian (1738-1805), Dutch hydraulic engineer, b. Neckerau, who was given the control of the dykes in Holland, and in this capacity carried out sev. important improvements. He is best known by an instrument, bearing his own name, which he invented, and which

enables the rapidity of a stream to be gauged.

Brünn, *see* BRNO.

Brunne, Robert of, *see* MANNING, ROBERT.

Brunnen, vil. in Switzerland, the most frequented place on the lake of Luzern after Luzern itself. It lies on the St Gotthard railway, has a rack and pinion railway, many hotels, and very picturesque scenery. The Forest Cantons renewed their league here in 1316.

Brunner, Emil (1889-), Swiss Protestant theologian, b. Winterthur. With Barth (q.v.), pastor of a neighbouring par. during the First World War, he led a revival of the Renaissance tradition by developing 'dialectic theology' (Christian revelation) against modernism and liberalism. B. and Barth differed, however, concerning the balance between reason and revelation, B. holding that the latter is in congruity with anthropology and the fulfilment of hist. He became a follower of Frank Buchman (q.v.). Works include *Das Symbolische in der religiösen Erkenntnis*, 1914, *Die Mystik und das Wort*, 1924, *The Word and the World*, 1931, *Wahrheit als Begegnung*, 1938, *Gerechtigkeit*, 1943, and *Christianity and Civilisation (First Part: Foundations)*, 1948.

Brunner, Heinrich (1840-1915), Ger. juriconsult and historian, b. Wels, Upper Austria. He studied at Vienna, Göttingen, and Berlin, taught Ger. law at Vienna, was appointed prof. at the univ. of Lemberg in 1866, at Prague in 1870, and afterwards at Strasburg. In 1872 he became prof. of Ger. civil, commercial, and maritime law at Berlin. B. did most valuable research work in the hist. of Fr. law, studying minutely the early laws and institutions of the peoples of W. Europe, especially the Franks. He was the leading authority on modern Ger. law. His chief works are *Die Entstehung der Schwurgerichte* (dealing with the Eng. and Fr. jury systems), *Deutsche Rechtsgeschichte* (contained in vols. I. and II. of *Bindung's Handbuch der deutschen Rechtswissenschaft*, 1887-92), and contributions to *Monumenta Germaniae historica*.

Brünnow, Franz Friedrich Ernst (1821-1891), Ger. astronomer, b. Berlin. He graduated Ph.D. in 1843 at Berlin Univ., and worked for some years at the Berlin Observatory. In 1847 he was appointed director of the Düsseldorf Observatory, and 4 years later succeeded Galle as first assistant at the Berlin Observatory. In 1854 he accepted the offer of director of the new observatory at Ann Arbor, Michigan, and in 1860 he went to the observatory of Albany, N.Y., as associate director, returning to Ann Arbor the following year. In 1866 he accepted the professorship of astronomy in Dublin Univ. and astronomer royal of Ireland, and carried out valuable work there in stellar parallaxes. His chief pub., *Lehrbuch der sphaerischen Astronomie*, appeared when he was at Düsseldorf, and in 1865 was trans. by himself into English; it has since been trans. into 4 other languages.

Bruno, St (c. 1030-1101), founder of the Carthusians q.v.), b. Cologne and

educ. there and at Rhelms and Tours. His ability and knowledge were famous throughout the Church, and he was speedily advanced. But having protested against the evil-doing of one of the archbishops, he was forced to seek safety in flight. Later he was offered eccles. preferment, but his appointment was opposed and he retired to a desert near Grenoble, where he founded the Carthusian order, 1084. He was again offered preferment in the Church, but declined it, and devoted himself to his order. He was the author of some commentaries on the Psalms and the Pauline Epistles, but none of his works is extant.

Bruno, Giordano (c. 1548-1600), It. philosopher, b. near Nola. At the early age of 15 he joined the Dominican order, and was ordained priest in 1572. Accused of heresy, he left Italy and travelled via Geneva and Toulouse to Paris, where he arrived in 1581. After 2 years in the Fr. capital, where he lectured and wrote sev. works, B. went to England, lectured for some time at Oxford, and wrote those works for which he is principally famed: *Cena della Ceneri*; *Della Causa, Principio, ed Uno*; and *Del' Infinito, Universo, e Mondi*. Disgusted with Eng. life and with the intellectual atmosphere of Oxford, he returned to Paris, whence he made his way to Wittenberg, Prague, Helmstadt, and Frankfurt. Here he pub. 3 metaphysical treatises: *De Triplici Minimo et Mensura*; *De Monade, Numero, et Figura*; and *De Immenso et Innumeralibus*, 1590. From Frankfurt B. went to Zürich, and thence to Venice, where he was arrested by the Inquisition (1593) and brought to Rome. After languishing in prison for 7 years, he was finally excommunicated and burned at the stake (17 Feb. 1600). Apart from his rejection of Aristotle's astronomy in favour of the Copernican system, B.'s thought tended towards pantheism. God, he maintained, is the universal and unifying substance of all phenomena, which proceed from Him of necessity; the universe is the realisation of the divine intellect. His Lat. works were ed. by F. Fiorentino and others (1879-91), and the It. writings by B. Croce and G. Gentile (1907, etc.). *See* G. Gentile, *Giordano Bruno nella Storia della Cultura*, 1907, and W. Boulting, *Giordano Bruno*, 1916.

Bruno the Great (c. 925-65), Archbishop of Cologne and later Count of Lorraine, was the third son of Henry the Fowler (q.v.). He was one of the most important men of his time, distinguished for piety and learning. To him are ascribed a commentary on the Pentateuch and a vol. of lives of the saints.

Brunonia, family Goodeniaceae; genus of one species, *B. australis*, a stemless perennial herb with blue flowers of Australia, needing greenhouse conditions in Britain.

Brunonian System, in medicine a system which regards disease as due to variations in a natural stimulus, its excess causing sthenic and its deficiency asthenic diseases. *See* BROWN, JOHN (1735-88).

Brunow, Ludwig (1843-?), Ger. sculptor,

b. near Lübz in Mecklenburg-Schwerin. He was at first a carpenter, but going to Berlin in 1866 he found a patron in Friedrich Eggers, with whose help he was trained as a sculptor. In 1871 he produced the group 'The Harbinger of Love and the Fulfilled Dream,' a 'Pegasus,' and the reliefs 'Bride of Corlaith' and 'Family Happiness.' After 2 journeys to Italy he was commissioned to execute colossal figures of the emperors Frederick I and Frederick William II, as well as many groups and busts. The date of his death is unknown.

Brunsbüttel, Ger. vil. in the *Land* of Schleswig-Holstein (q.v.), 50 m. SW. of Kiel (q.v.). It stands at the point where the Kiel Canal enters the Elbe (qq.v.). On the opposite bank of the canal is the modern industrial tn of Brunsbüttelkoog (pop. 11,000).

Brunswick, Friedrich Wilhelm, Duke of (1771-1815), Prussian general. Deprived of his duchy by the treaty of Tilsit in 1807, he took up arms against France, whose sworn enemy he became. He fought in the Austrian campaign of 1809, and, refusing to lay down his arms on the conclusion of peace, went with his troops to England and put himself at the service of the Brit. Gov., in whose service he fought in Portugal and Spain. He was reinstated in his sovereign rights in 1815, but was killed at Quatre-Bras.

Brunswick, Karl Wilhelm Ferdinand, Duke of (1735-1806), Prussian soldier, married Augusta, a sister of George III, and served in sev. campaigns. In 1780 he became duke on his father's death, and in 1792 he led the Austrian and Prussian Army that was so signally defeated by the French at Valmy. He held a high command in the allied armies until, commanding the Prussians, he was wounded at Auerstadt and d. subsequently. His son, Friedrich Wilhelm (q.v.), commanded Brunswick troops at Quatre-Bras.

Brunswick (Ger. **Braunschweig**): 1. Former Free State, later *Land*, of N. Germany, now part of the *Land* of Lower Saxony (q.v.). It consisted of 3 larger and 6 smaller enclaves in Prussian Saxony and Hanover: the prin. div., containing B. city, was oval in shape, and lay between Prussia and Hanover; the second, a long, irregular stretch of land, divided Hanover; the third, of irregular shape, was surrounded almost entirely by Prussian ter.; and the remaining 6 divs. were mainly in Prussian ter. clustered around the Hanover boundaries. The total area was 1424 sq. m.

History. In the 10th cent. the lands which later formed B. were in the possession of the family of Brunos, whence the name B. is derived. They passed in the 12th cent. into the hands of a member of the Welf family (see GUELPHS), Henry the Proud, and from him to his son, Henry the Lion (q.v.). When Henry incurred the displeasure both of the Pope and of the emperor, he was allowed to keep his B. lands, and in this way they passed into the hands of Otto, his grandson, who was made Duke of B. and Lüneburg by Frederick II. Between the 13th and

16th cents. the duchy underwent a number of changes. It was divided first into the duchies of Lüneburg and B., and again the latter was continually a bone of contention and underwent a number of divs. until, in the 16th cent., it was again united under Duke Julius, who not only reunited it, but added to it also. In the 16th cent. an important div. of the duchy of Lüneburg took place, and one of the divs. made then ultimately became the kingdom of Hanover. After this div. the duchy of B. was ruled in the direct line until the 18th cent. (1735), and again from that date until 1884. B. took an important part in the Franco-Ger. war (q.v.) and became a state of the Ger. Empire in 1871. In 1884 the direct line of dukes failed, and the duchy should have passed to George, Duke of Cumberland, who had until just previously to that time been King of Hanover, but had been deposed by Prussia. Prussian influence was brought to bear, however, and a Prussian prince was elected to the duchy in 1885. In 1906 the Prussian regent d.: the claims of the Duke of Cumberland were again overlooked, and Duke John Albert of Mecklenburg-Schwerin was chosen as regent. On 21 May 1913 Ernst August, son of the Duke of Cumberland, married the Kaiser's daughter, Victoria Louise, and took the oath of allegiance to his father-in-law. On 1 Nov. 1913 he ascended the throne, and reigned until 8 Nov. 1918, when the revolution forced him to abdicate and an extremist Socialist gov. was formed. After various changes a moderate Socialist gov. was returned in 1927, but this gave way in 1933 to the Nazi regime; the state was then under a stadtholder, who was the representative of the chancellor, Hitler (q.v.). In the Second World War B. was overrun by Amer. forces in Mar.-April 1945. See WESTERN FRONT IN SECOND WORLD WAR.

2. Ger. city in the *Land* of Lower Saxony (q.v.), on the Oker, 35 m. E. by S. of Hanover (q.v.). It was founded by Henry the Lion (q.v.), and was an important member of the Hanseatic League (q.v.). During the Reformation it favoured the doctrines of Luther (q.v.), and took an active part in the social and religious wars of the period. It was the scene of a violent revolution in 1832, and it became municipally self-governing in 1834. In 1919 it was for a time in the hands of Red revolutionists, until Ger. gov. troops occupied the city on 17 April. During the Second World War much of the city was gravely damaged by bombing in 1944, especially on 30 Jan., 15 and 29 Mar., and 8 April (see AIR RAIDS). There has been a great deal of reconstruction since the end of the war. The Romanesque cathedral (1173-95) contains the magnificent tomb of Henry the Lion, who is also still commemorated by the 'B. Lion,' a bronze statue he erected in 1166. Another tomb in the cathedral is that of Queen Caroline (q.v.), the wife of George IV. There are sev. other notable churches and a 14th-15th-cent. inn hall. The timbered houses for which B. was famous were destroyed in the war. Motor

vehicles, pianos, calculating machines, optical instruments, and foodstuffs are manuf. Pop. 241,850.

Brunswick: 1. Formerly a tn. of co. Bourke in Victoria, Australia, 4 m. N. of Melbourne; now included in Melbourne.

2. Co. seat of Glynn co., Georgia, U.S.A. It is situated on St Simons Sound, and is an important port. Its exports are cotton, yellow pine lumber, and naval stores. There are shrimp and crab processing plants, shipyards, and crossting works. It has steamship communication with New York and Savannah. Pop. 17,954.

3. City in Cumberland co., Maine, U.S.A. It is situated on the S. bank of the R. Androscoggin, close to its mouth, 25 m. NE. from Portland. It is noted for the Bowdoin College at which Longfellow and Hawthorne graduated. There are cotton and paper mills and food canneries; B. is the trade centre for a resort area. Pop. 11,000.

Brunswick, New, see NEW BRUNSWICK.

Brunswick Black, composition of lamp black (q.v.) and turpentine, or of asphaltum, rosin, and turpentine, used for giving a jet-black appearance to iron articles.

Brunswick Green, light green pigment. The term is applied to: (1) oxychloride of copper, prepared by the action of sal ammoniac on copper filings, or by boiling copper sulphate with a small quantity of bleaching powder; (2) carbonate of copper; (3) a mixture of Prussian blue, or indigo, with chrome yellow, a small quantity of gypsum being added.

Brunton, Sir Thomas Lauder (1844-1916), physician, b. Hiltonshill, Roxburghshire. He was educ. at Edinburgh Univ. In 1870 he was lecturer in materia medica and pharmacology at Middlesex Hospital; in 1871 he occupied a similar post at St Bartholomew's Hospital; 1874, assistant physician there; 1895, physician; resigned in 1905, and became consulting physician at the same hospital. In 1886 he was a member of a commission to report on the treatment of hydrophobia, and he went to Paris to study Pasteur's system. He made a special study of the action of drugs and their application in disease; he introduced amyl nitrite in the treatment of angina pectoris and made important observations on the action of digitalis. Prin. works: *The Bible and Science*, 1881; *Disorders of Digestion*, 1886; *A Textbook of Pharmacology and Therapeutics*, 1888; *Collected Papers on the Circulation and Respiration*, 1906. He was knighted in 1900 and created baronet in 1908.

Bruny Island is situated off the SE. of Tasmania. It is 32 m. long, from 1½ to 10 m. broad, and has an area of 160 sq. m. Coal-mining is the chief industry.

Brush, in electrical engineering: a contact sliding on a rotating slipring or commutator (see ELECTRIC MACHINES).

Brush Discharge, see ELECTRIC DISCHARGE.

Brush Turkey, or *Alectura lathami*, is a species of the family Megapodidae, or mound-birds, found in Australia. The birds lay their eggs in mounds of earth or

sand, and the mature bird is about the size of a turkey, brownish-black in colour.

Brushes, instruments used for removing dust or dirt from the surface of anything, and also for applying paint or some similar substance to a surface. The instrument, when made of long twigs, usually of birch, is called a broom, a name which is equally applied to the instruments which are used for household purposes when the handle is long. The materials generally used for the manuf. of B. consist of either the hair of various animals or vegetable fibre or nylon. B. made of steel wire are used nowadays for a variety of purposes, such, for example, as cleaning the inside of a boiler, or for cleaning tubes. B. may be divided into two classes, compound and simple. The latter kind of brush is best exemplified in the hair pencils of artists, and is made of one single tuft of hair. They are usually bound with quills. The compound brush can again be divided into two, 'set' brush and 'drawn' brush. Of the former the best example is the ordinary house-brush, and of the latter the hairbrush. Many kinds of fibre-made B. are usually made by machinery; one of the best brush-making machines being patented in America in 1870—the Woodbury machine. Revolving B. and various other contrivances of this description have been used frequently for the cleaning of the streets, and as early as the end of the 17th cent. one of these machines was in use in London.

Brusilov, Aleksey Alekseyevich (1853-1926), Russian general, an outstanding representative of National Bolshevism (q.v.). In July-Aug. 1917 he was Supreme Commander-in-Chief of the Russian forces; after the October Revolution (q.v.) he served in the Red Army. During the Polish-Soviet war (1920) B. appealed to all Russian officers to join the Red Army. See his *A Soldier's Notebook*, 1914-18, 1930.

Brussels (Fr. *Bruxelles*; Flem. *Brussel*), cap. of Belgium and of the prov. of Brabant, situated nearly in the centre of the kingdom in lat. 50° 51' N, long. 4° 21' E. It is built in the valley of the R. Senne and on the surrounding hills. The climate is healthy, but is variable and usually humid. As the most important tn in the kingdom, B. is the centre of legislation, education, and of artistic life. It contains the royal seat, the chief courts, the chamber of commerce, and is the centre of the prin. banks of the country. It is also a most important industrial centre for all kinds of manufs. Its lace is still considered to be the best in Europe. B. is connected with Antwerp by a ship canal to the R. Rupel, trib. of the Scheldt. It is a junction of sev. international railways and airways. The pop. of the city of B. was 175,000 at the end of 1955, and of Greater B., 1,362,000, including the 17 suburbs: Anderlecht, Auderghem, Etterbeek, Evre, Forest, Ganshoren, Ixelles, Jette, Koekelberg, Molenbeek-St-Jean, St-Gilles, St-Josse-ten-Noode, Schaerbeek, Uccle, Watermael-Boitsfort, Woluwe-St-Lambert, and Woluwe-St-Pierre. The boulevards which

surround the city proper owe their origin to Napoleon. The upper tn, traversed by the rue Royale and the rue de la Régence leading to the Palais de Justice, is the best residential quarter. B. is one of the most modern tns in Europe and in many respects it compares favourably with Paris. Amongst its many buildings may be mentioned the king's palace, which occupies the site of the old palace, burnt down in 1731, and has been much improved of late years. The whole city



Belgian Embassy

BRUSSELS: THE TOWN HALL

is known for the beauty and antiquity of its buildings and for the magnificence of its squares and avenues. The Grand-Place, in the old part of the tn, is one of the finest and most interesting of all the squares in Europe, both from the interesting historical events which have taken place there and from the beauty of the surrounding buildings. In this square are to be found the Hôtel de Ville (15th cent.), the Maison du Roi, and 17 famous guild houses of the industrial corporations. Other medieval buildings are the churches of St Gudule, Notre-Dame des Victoires, and Notre-Dame de la Chapelle. A number of these buildings contain very fine interior decorations. The free and independent univ. was founded in 1834 by the Belgian Liberals. B. was probably a military camp during Rom. times, and is first mentioned by a name resembling B. in the 8th cent. In the 10th cent. it

is mentioned by the Emperor Otto, and in the course of time it became the centre of the gov. The Dukes of Brabant for some considerable time dwelt in it, building their castle on the site of the present royal palace. This palace afterwards became famous as the palace of the Netherlands, and witnessed the abdication of the Emperor Charles V. During the war of the Protestant Succession it was bombarded by the Fr. general Villeroi in 1695 and great damage was done to it, a number of churches and many houses being destroyed by red-hot shot. During the Fr. Revolution the rep. was proclaimed here, and after the revolution of 1830 B. became the cap. of Belgium. On 20 Aug. 1914 the Ger. Army made a triumphal entry into unfortified B. The main body marched on to Mons and Charleroi on the road to Paris. On 2 Sept., Marshal von der Goltz was appointed governor-general of Belgium, and made his H.Q. in B. The Belgian troops retreated from Antwerp in Oct. to a few miles from the Fr. frontier and for 4 years B. was occupied by the Germans, although 'underground' Belgian resistance continued throughout, in spite of Ger. reprisals. On 22 Nov. 1918 the citizens welcomed home King Albert and Queen Elizabeth, who had never left the remaining unconquered strip of their country. In the great hall of the Royal Museum of the Army are preserved many relics of the war, but the *Tir National*, the shooting range just outside the city, with 4 posts marking the spot where 35 civilians were shot for defying the Ger. invaders, is a greater stimulus to Belgian patriotism. There is also a monument near the Avenue Longchamp to the Brit. Nurse Cavell (q.v.), who was shot for helping Brit. prisoners to escape. In 1923 the Brit. monument commemorating the brotherhood of the Brit. and Belgian nations, a replica of that on the Victoria Embankment, was unveiled at B.

In the Second World War B. was occupied by the Germans from 17 May 1940, until liberated by Gen. Dempsey's Second (Brit.) Army on 3 Sept. 1944. On one or more occasions in 1940 the Germans deliberately bombed B. by night and laid the blame on the Brit., but the ruse was soon exposed. Once again the *Tir National* was the scene of brutal executions, some 400 patriots being shot and buried by the Germans. The univ. was closed on 18 Aug. 1942, because of the hostility of the profs. to Germany's 'New Order' (q.v.). As a final act of cruelty the Germans, on the eve of their retreat, set fire to the Palais de Justice, and the lofty cupola, which dominated the whole city, was completely burnt out. The Belgian Cabinet returned from London to B. on 8 Sept. 1944.

A great international exhibition was held in B. in 1958, the first of its kind since the Second World War.

'Brussels,' ship belonging to the then Great E. Railway Co. While conveying passengers between Harwich and Rotterdam in July 1916, it was captured by a Ger. torpedo-boat flotilla and the captain,

C. A. Fryatt, was shot on a charge of having attempted to ram a Ger. submarine in Mar. 1915. The *B.* was sold to Mr T. B. Stott, a Liverpool shipowner, at the Baltic Exchange, for £3100, on 19 Aug. 1920. See FRYATT, CAPT.

Brussels Conferences. A number of international conferences have been held in Brussels. In 1874 a conference attended by most European powers met there at the suggestion of the Tsar, its object being to improve the conditions of prisoners-of-war, etc. No important re-

cruciferous plant. The main stem of the plant bears numerous lateral leaf-buds in the axils of the leaves, each bud a kind of pygmy cabbage. The sprouts are succulent, and are eaten as a vegetable, coming into season in the autumn and winter.

Brussels Treaty (1948), 50-year treaty of collective military aid and economic and social co-operation signed by Great Britain, France, Belgium, the Netherlands, and Luxembourg, at Brussels on 17 Mar. 1948. It gave concrete form



D. McLeish

BRUSSELS: THE BOURSE

sults followed. In 1876 King Leopold summoned representatives (quite unofficial) of the great powers to decide on the best way of exploring and opening up Africa to European trade and civilisation. The outcome was the creation of the Congo Free State. In 1890-1900 the anti-slavery conference met at Brussels for the purpose of suppressing the slave trade in Africa. In 1901 an international conference on sugar bounties was held there. Since the First World War Brussels has somewhat lost its old position as the *venue* of international conferences. In 1920 the financial experts of the Allies met there, prior to the Spa Conference, in the endeavour to fix the total of reparations to be paid by Germany. In 1937 a conference met at Brussels to try to deal with the Jap. invasion of China. In 1948 the Brussels Treaty (q.v.) was signed here.

Brussels Sprouts. *Brassica oleracea* var. *gemmifera*, variety of the cabbage, a

to the policy of a W. Union as formulated in outline by Ernest Bevin, Brit. foreign secretary, after the failure of the 4 major allies to agree upon the terms of the Ger. peace treaty at a time when the menace of Russian Communism called for solidarity among the nations of W. Europe. Aimed, however, against no individual nation, it is no ordinary treaty but is one which is designed to defend and to enrich the W. way of life. By the economic clauses of the treaty, the parties undertake so to organise and co-ordinate their economic activities as to produce the best possible results by the elimination of conflict in their economic policies, the co-ordination of production, and the development of commercial exchanges. A consultative council provides the instrument by which these aims may be realised. Article IV, which is based on Article 51 of the Charter of the U.N. (q.v.), is the core of the treaty. It carries the assurance of automatic assistance to any

one of the contracting parties which becomes the object of armed attack in Europe. Each of the signatories undertakes to give assistance to any one of its partners without waiting for agreement on a joint plan of action. Nor is the undertaking limited to attacks on the territory of the 5 nations; the words 'in Europe' may be taken to include an attack upon allied interests anywhere on the Continent. Outside Europe there is no automatic obligation. Article VII provides that the consultative council may be convened 'in case of the renewal by Germany of an aggressive policy; with regard to any situation which may constitute a threat to peace in whatever area this threat should arise; or with regard to any situation constituting a danger to economic stability.'

Brut, or **Brutus the Trojan**, hero of Brit. legend. According to Geoffrey of Monmouth, the hero who gave his name to Britain. This story is also related by the Anglo-Norman, Geoffrey Gaimar, who based his rhymed chronicle, *Estorie des Bretons* (not extant) on the version of Brit. hist. put forth by Geoffrey of Monmouth; by Geoffrey Wace; and by Layamon. Wace's *Brut d'Angleterre* (1155) is a liberal paraphrase of Geoffrey of Monmouth's work and soon eclipsed Gaimar's metrical chronicle. Wace did not, however, add much of any consequence to Monmouth's hist., though he does speak of the round table, a subject not mentioned by Geoffrey of Monmouth. Layamon, whose *Brut* (early 13th cent.) is an expansion of Wace's hist. or romance of chivalry, surpasses Wace in realism and fire even more than Wace surpasses Geoffrey of Monmouth. B. is supposed to have been the grandson of the 'pious Aeneas'; he was banished from Italy, and after many adventures reached Britain. He is supposed to have founded a new city of Troy (Troynovant), which was erected on the present site of London.

Bruté, **Simon William Gabriel** (1779-1839), Amer. prelate and first Rom. Catholic bishop of the diocese of Vincennes, Indiana, U.S.A., was b. Rennes, France. In 1810 he settled in Baltimore, Maryland, whither his interest in missions and his acquaintance with Bishop Flaget of Kentucky had drawn him. He held an unrivalled place in the Amer. Church from 1818 to 1834, being constantly consulted by the clergy, and frequently lecturing and teaching. Characteristic stories are narrated of the high respect in which he was held by the Indians, who called him the 'Chief of the Black Robes.' See J. R. Bailey, *Memoirs of the 1st Rev. S. W. G. Bruté*, New York, 1861.

Bruton, picturesque small tn of Somerset, England, 11 m. from Frome, formerly the seat of a priory, to-day chiefly an educational centre for nearly 1000 children. Pop. 1800.

Brutus, **Decimus Junius** (84-43 BC), served first in Gaul under Caesar, who afterwards made him commander of his fleet. Later he was made master of the horse and governor of Gaul, and Caesar, who held him in much esteem, made him

his heir in the event of Octavian's death. But in spite of this, he was one of the conspirators in the plot against his benefactor. Afterwards he fought with brief success against Antony, but was betrayed to, and put to death by, the latter soon after the siege of Mutina in 43 BC.

Brutus, **Lucius Junius**, one of the first 2 consuls, 509 BC. According to legend his father and brother were both murdered by the Tarquins; Junius escaped by feigning madness. B. took a leading part in the expulsion of the kings, and put his own sons to death for conspiring to restore them. He was killed in single combat by Aruns, son of Tarquin.

Brutus, **Marcus Junius** (79-42 BC), one of the murderers of Julius Caesar, and a governor of Cisalpine Gaul; lost his father when he was only 8 years old, and was trained by his uncle, Cato, in the principles of the aristocratic party. During the early part of his manhood he practised as an advocate. His mother, Servilia, was half-sister of Cato of Utica. On the outbreak of civil war (49) he joined Pompey, despite the fact that it was at the latter's order that his father had been slain (77 BC). After the battle of Pharsalus (48) Caesar pardoned him and made him governor of Cisalpine Gaul in 46, praetor in 41, and promised him the governorship of Macedonia. But notwithstanding the many obligations he was under to Caesar he was persuaded by his friend, Gaius Cassius, to join the conspiracy against his benefactor under the delusive idea of again establishing the rep. After the murder of Caesar, B. seized Macedonia, and having joined forces with Cassius, who was then commanding in Syria, the two opposed their united forces to the armies of Octavian and Antony. Two battles were fought near Philippi (42). B. being victor in the first, but in the second battle he was defeated, and took his own life. During his short life he was an earnest student of literature and philosophy, but appears to have been deficient in judgment and originality, this being the character given to him by Shakespeare (see *Julius Caesar*). He wrote some philosophical treatises and some poetry, but nothing whatever of these has come down to us. His only extant writings consist of portions of his correspondence with Cicero.

Bruun, **Malte Conrad**, see MALTE-BRUN.

Brûx, see MOST.

Bruxelles, see BRUSSELS.

Bruyère, **Jean de La**, see LA BRUYÈRE. **Bruyn**, **Brun**, or **Bruin**, **Cornelius** (1652-1719), Dutch painter and traveller, b. The Hague. He studied painting in Rome and Venice, and visited Asia Minor, Egypt, Russia, and Persia. From the drawings made during his travels he obtained sufficient data to publish 2 profusely illustrated vols. of his journeys, the prin. value of which lies in the beauty of the plates.

Bry, or **Brie**, **Theodorus (Dirk) de** (1528-1589), Ger. publisher and engraver, b. Liège. He set up as a printseller and bookseller at Frankfurt, and it is supposed that his career as an engraver began

rather later. He executed many fine etchings and engravings for various books of voyages and topography, including a voluminous *Collectiones Peregrinationum in Indiam Orientalem et Indiam Occidentalem* (*Collections of Travels to the East and West Indies*), in gathering which he was assisted by Hakluyt. He excelled also in such series as 'The Wise and Foolish Virgins,' a set consisting of 10 plates; 'The Muses,' in 9 plates; a 'Dance of Peasants'; 'Dance of Lords and Ladies'; etc. That B. lived for a time in London is attested by the existence of 2 extremely rare sets of plates executed by him there; those are a 'Procession of the Knights of the Garter,' a set consisting of 12 parts, and 'Sir Philip Sidney's Funeral Cortège.' B. signed his work sometimes with his initials, sometimes with a monogram, and at other times with 'Toremaeus Briancens.' His son, Johannes T. de B. (1561-1623), carried on his business after his death.

Brya is a genus of leguminous plants found in central America and the W. Indies. *B. Ebenus* is noted for its wood, known as Jamaica ebony or cocowood.

Bryan, William Jennings (1860-1925), Amer. politician, b. Salem, Illinois, and educ. at Illinois College and Union College of Law, Chicago. In 1891 he was elected to Congress from the First Dist. of Nebraska, which had always been Republican, but the Democrat B. carried it on the strength of his 'free silver' speeches. He served 2 terms in Congress, and took a leading part in the debates on the questions of bimetallism and free trade. When the presidential convention of the Democratic party met in Chicago in 1896, it was known that the issue would be joined between the gold standard Democrats of the E. and the free silver forces of the W. and S. While the old experienced politicians were trying to agree on a presidential nominee, B. upset all their plans and changed the currents of Amer. political hist. by making one of the greatest speeches of his career. He swept the convention off its feet by a speech for free silver in which he used his famous phrase: 'You shall not crucify mankind on a cross of gold!' B. was nominated for the presidency on a free silver plank. The Republicans promptly nominated Wm McKinley on a gold standard. There ensued one of the most exciting campaigns in the hist. of the country. But, though B. had carried states like Colorado and Washington, that had always been considered safely Republican, McKinley secured 271 electoral votes to 176 for B. Undismayed by the defeat of 1896, the Democrats renominated him for president against McKinley in 1900. This time he coupled with free silver a bitter crusade against imperialism growing out of the U.S.A. having annexed the Philippines, Guam, and Puerto Rico as a result of the victories in the war with Spain. B. once more went down to crushing defeat. But once more in 1908 the Democrats nominated B. and once more B. lost. When Woodrow Wilson was elected president, he named B. as secretary of state. B. held office until June 1913, when he

resigned because of the firm attitude the President took after the Germans sank the *Lusitania*. He also pub. various books, among them *The First Battle*, 1896, and *Speeches*, 1909. See his memoirs, completed by Mrs B. after his death (1925).

Bryan, city in Brazos co., Texas, U.S.A. The Agric. and Mechanical College of Texas is 5 m. away. Pop. 18,000.

Bryanites, see METHODISM.

Bryansk: 1. Oblast in central Russia, SW. of Moscow. It is situated largely in the Desna Poles'ye lowland, and partly covered with mixed forests (B. Forests). It has large peat deposits. Area 13,400 sq. m.; pop. (1956) 1,551,000, mostly Russians (before the Second World War also Jews). There are engineering, cement, glass, cloth, wood-processing, and other industries, grain, potato, and hemp growing, dairy cattle and hog raising, and bee-keeping. The prin. tns are B. and Klintsey. B. industrial area has been prominent since the 18th cent.

2. Cap., economic and cultural centre of the above, on the R. Desna. In 1956 it absorbed Bezhitsa (q.v.). It is a large industrial and transportation centre (locomotives, rolling stock, other engineering, cement, clothing, meat processing, large peat-fed power station; 6 railway lines). It is on the gas pipeline Dashava (q.v.)-Moscow; an oil pipeline is under construction from Kuybyshev. Pop. (1956) 185,000 (without Bezhitsa, 111,000; 1913, 31,000). B. has been known since 1146 as a fortress and cap. of a principality; from the 14th cent. it was Lithuanian, from the 16th cent. Muscovite. Since the 1860's it has been the administrative centre of B. industrial area.

Bryant, Sir Arthur Wynne Morgan (1899-), historian, b. Dersingham, Norfolk, son of Sir Francis B. Educ. at Harrow and Oxford, he was a pilot in the Royal Flying Corps in the First World War, and afterwards was called to the Bar at Inner Temple. His works include 3 vols. on Pepys: *The Man in the Making*, 1933, *The Years of Peril*, 1935, and *The Saviour of the Navy*, 1938; lives of Charles II, 1934, George V, 1936, and Stanley Baldwin, 1937; and a Brit. historical series: *The Years of Endurance, 1793-1802*, 1942, *Years of Victory, 1802-1812*, 1944, and *The Age of Elegance, 1812-1832*, 1950. *English Saga*, 1940, is a survey of the last hundred years, and *The Turn of the Tide*, 1957, based on the diaries of F.-M. Lord Alambrooke, deals with the Second World War. B. was made a C.B.E. in 1949 and knighted in 1954.

Bryant, Sophia (1850-1922), school-mistress, daughter of Dr Wilcock, Irish national educationalist. Widowed soon after marriage, she pursued her studies, and in 1884 received the doctorate of science in the univ. of London, being the first woman to achieve this distinction. She was very interested in child psychology, at that time receiving the attention of a growing number of educationalists. Her *Experiments in Testing the Character of School Children* was a pioneering

and influential study. After being mathematical mistress at the N. London Collegiate School, she succeeded the well-known Miss Buss in 1895 as its head mistress. She also served on the Royal Commission on Secondary Education in 1894. Litt.D., Dublin, 1904. Killed while mt climbing in the Alps.

Bryant, William Cullen (1794-1878), Amer. poet and journalist, b. Cummington, Massachusetts. Admitted to the Bar in 1815, he practised law at Plainfield, Massachusetts, and later at Great Barrington. During this time he gained a reputation as a poet, and in 1821 delivered 'The Ages' as the Phi Beta Kappa poem at Harvard. In 1825 he removed to New York, and became co-editor of the *New York Review*, and in 1828 took up the editorship of the *New York Evening Post*, in which position he remained till his death. His journalistic work, mainly concerned with the anti-slavery movement, is marked by simplicity and vigour of style, together with common sense and breadth of view. He is best known, however, as a poet, and issued sev. vols. of collected poems. Among his most famous verses are 'Thanatopsis,' 'To a Waterfowl,' 'The Death of the Flowers,' 'My Country's Call,' 'The Battlefield,' and 'The Flood of Years.' He also pub. *Letters of a Traveller*, 1850, *Letters from Spain and Other Countries*, 1859, *Letters from the East*, 1869, *Orations and Addresses*, 1873, and metrical versions of the *Iliad* and the *Odyssey*, 1870-2. See Parke Godwin (ed.), *Life and Works*, 1883-4, and lives by J. Bigelow, 1890, and W. A. Bradley, 1905.

Bryaxis is a genus of Coleoptera of the family Psclaphidae. They are tiny beetles with very short elytra, which cover only half the abdomen, and they are found in moss occasionally, but usually in ants' nests.

Bryce, George (1844-1931). Canadian clergyman and educator, b. Mt Pleasant, Brantford, Ontario. Graduated at Univ. of Toronto, 1867. Ordained to Presbyterian ministry, 1871. He founded Manitoba College and was principal, 1877-1909. Moderator of Presbyterian General Assembly of Canada, 1902; president of Royal Society of Canada, 1909-10. B.'s works include *Manitoba: Infancy, Growth, and Present Condition*, 1882, *John Black, the Apostle of Red River*, 1898, *The Remarkable History of the Hudson's Bay Company*, 1900 (3rd ed., 1910), *Mackenzie, Selkirk, and Simpson in Makers of Canada*, 1905 (new ed., 1926), *Romantic Settlement of Lord Selkirk's Colonists*, 1909, *Short History of the Canadian People*, 1910, and *Canada and the Northwest*, 1912. Collaborated with W. W. Campbell in *The Scot in Canada*, 1911.

Bryce, James, Viscount, of Dechmont, co. Lanark (1838-1922). Brit. statesman and historian; b. Belfast, and educ. at Glasgow and Trinity College, Oxford. In 1864 he pub. a monograph, *The Holy Roman Empire*, an enlarged form of his Arnold prize essay, which gained him an immediate reputation as an historical writer. In 1867 he became a barrister at Lincoln's Inn, and in 1870 was appointed

regius prof. of civil law at Oxford. He entered Parliament in 1880 as Liberal member for the Tower Hamlets, and rapidly became prominent among the followers of Gladstone. In 1885 he was returned for S. Aberdeen, and in 1886 became under-secretary for foreign affairs under Lord Rosebery. During Gladstone's next ministry B. became chancellor of the duchy of Lancaster, with a seat in the Cabinet, in 1892; and in 1894 president of the Board of Trade in Lord Rosebery's administration. He was an original fellow of the Brit. Academy, founded 1902, and chairman of its historical and archaeological committee. In 1905 he was appointed chief secretary for Ireland, and in 1907 succeeded Sir Mortimer Durand as Brit. ambas. to the U.S.A., resigning in 1912. He was made a viscount in 1914. Soon after the outbreak of the First World War, B. presided over a committee of jurists appointed to inquire into alleged Ger. outrages in Belgium. As a politician, he was conspicuous in his advocacy of Home Rule for Ireland, the abolition of univ. tests, international copyright, and revision of the statute law. His pubs. include *The American Commonwealth*, now a classic, 1888, *South America*, 1912, and *Modern Democracies*, 1921. See life by H. A. L. Fisher, 1927.

Brydges, James and John, see CHANDOS. **Brydges, Sir Samuel Egerton** (1762-1837), bibliographer and genealogist, b. Kent. He was educ. at Maidstone, Canterbury, and Cambridge. In 1787 he became a barrister, but 5 years later he left his profession, preferring a quiet country life. His bibliographical works include *Censura Literaria, containing Titles, Abstracts, and Opinions of Old English Books* (10 vols.), 1805-9, *British Bibliographer* (4 vols.), 1810-14, *Restituta, or Titles, Extracts, and Characters of Old Books in English Literature revived* (4 vols.), 1814-16. His other works were eds. of E. Phillips's *Theatrum Poetarum Anglicanorum*, 1800, Collins's *Peagee*, 1812, and of many rare Elizabethan authors. In 1808 he was made a knight of the Swedish order of St. Joachim. From 1812 to 1818 he sat for Maidstone, and afterwards lived abroad, chiefly at Geneva. See his autobiography, 1834.

Bryher, one of the inhabited Scilly Is. Area 317 ac.; pop. 80.

Brylov, Constantin Karl Pavlovich, see BRÜLOV.

Brynjúlfsson, Gísli (1827-88), Icelandic poet and scholar, who for the greater part of his life resided in Copenhagen, where he was lecturer in Icelandic at the univ. He was deeply affected by the liberation movement that spread over the Continent about the middle of the 19th cent., and many of his poems are written in praise of freedom. Like most other Icelandic poets of his time he was influenced by Byron.

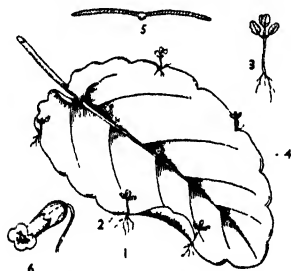
Brynmawr, mrtk and mining tn in Breconshire, Wales, 14 m. from Brecon. Pop. 6370.

Bryology (Gk *bruron*, moss; *logos*, speech), the science of botany which treats of mosses (q.v.) and liverworts.

Bryonia (Bryony), an Old World genus of Cucurbitaceae, which is represented in Britain by *B. dioica*, the white bryony of our hedges. The root was formerly much used in rural pharmacy, and the flowers are the sole source of food of the bees of the species *Andrena florea*. The black bryony (*Tamus communis*), another common hedge plant, belongs to an entirely different family, and is poisonous. See TAMUS.

Bryonin is an amorphous, bitter substance which can be extracted by boiling water from the root of *Bryonia dioica*. It is a yellowish-white substance, sometimes tinted with red or brown. It is a drastic purgative, and poisonous in large doses.

Bryophyllum, succulent genus of Crassulaceae, is common to S. Africa and Madagascar. It is remarkable for the adventitious buds which occur on the margins of the leaves. *B. pinnatum* is cultivated in Brit. hot-houses, and *B. proliferum* is another common species.



LEAF OF BRYOPHYLLUM

1. Roots of young plant. 2. Young plant.
3. Young plant detached. 4. Leaf.
5. Section of leaf. 6. Flower.

Bryophyta (Gk *bruton*, mossy seaweed; *phuton*, plant), one of the large divs., groups, or phyla of the plant kingdom, which includes the 2 classes Liverworts (Hepaticae) and Mosses (Musci). The B. consist of plants consisting entirely of cells, no vessels being formed in any part. The sexual organs consist of archegonia and antheridia. The antheridia are usually stalked ovoid or globular structures producing a large number of biciliate sperms, while the archegonia do not differ in essentials from those of the Pteridophyta; but both liverworts and mosses show alternation of generations, and are thus distinguished from Thallophyta. The most conspicuous stage in their life-hist., either the leafy plant of a moss or the green leaf-like thallus of a liverwort, is the gametophyte generation, while the sporogonium is the sporophyte generation which remains attached to the gametophyte, and is to a large extent dependent on it. All the B. are simple in form and structure.

Bryozoa, see POLYZOA.

Bryum, genus of mosses, belongs to the family Bryaceae. The species are

exceedingly numerous, and are found in great abundance in Great Britain. Among these are *B. lacustre*, *B. pendulum*, *B. cuspidatum*, and *B. arcticum*. *B. argenteum*, with silvery leaves, grows on waste ground, clindors, roofs, etc., and is common even in industrial dists.

Brzeg (Ger. *Brig*; anct *Civitas Altae Ripae*), tn of Poland, in Opole prov., on the Odra (q.v.), 27 m. NW. of Opole (q.v.). From 1311 until 1675 it was a duchy belonging to the Piast dynasty (see POLAND, *History*); it then passed to the Hapsburgs (q.v.). Before coming under Polish control in 1945 it was part of Ger. Silesia (q.v.), and had a large Ger. pop. (Chemicals are manuf. Pop. 8000 (1839, 31,419).

Brzezany, see BEREZHANY.

Bual Wine, see MADEIRA WINE.

Bubastis (modern Tell Basta, near Zagazig), Gk name of Bastet, the lioness-headed Egyptian goddess of Bast, and of her city. After the New Kingdom the cat was especially the animal of B. Many bronze statuettes of the goddess show a cat-headed woman holding in her right hand a lion aegis and on her left arm a basket. She was considered mother of Nefertem. B. is the largest anct site in the Delta after Tanis, with ruins of all periods from the Pyramid Age, including a large temple and cat cemetery. There is a royal residence of the 22nd dynasty. Herodotus describes a riotous festival of B.

Bubble, South Sea, see SOUTH SEA BUBBLE.

Bubble-shell, see BULLA.

Bubo (Gk *boubōn*, the groin), swelling and inflammation of a lymphatic gland, particularly of the groin, and usually associated with gonorrhea, syphilis, or plague (qq. v.).

Bubo is the Lat. term for a genus of owls of the Strigidae family. The species are characterised by a small carliap and 2 tufts or feathered horns on the head, while the legs are feathered to the toes. *B. ignavus* is the eagle-owl common to Europe, Asia, and Africa. See also EAGLE-OWL.

Subonic Plague, see PLAGUE.

Bucaco (Bussaco, Bussaco), mt ridge (1795 ft) of Portugal, in Beira Litoral prov. (q.v.), 12 m. NNE. of Coimbra (q.v.). It is the site of a monastery, and here Wellington (q.v.) repulsed the French under Masséna (q.v.) in Sept. 1810 (see PENINSULAR WAR).

Bucaramanga, city, cap. of Santander dept., Colombia, on R. Lebrija. Centre of the coffee trade, has large mines of gold, copper, and iron close by. It is a coffee market and general trading centre, with a range of light industries. Railway communication with Magdalena and an airport. Pop. over 112,000.

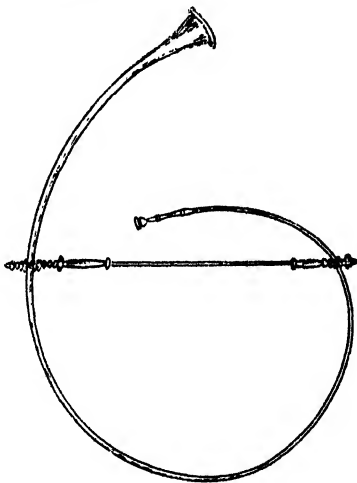
Bucarest, see BUCHAREST.

Buccaneers. Name applied to the bands of piratical adventurers, of various nationalities, who had their H.Q. in the W. Indies during the 17th cent. Their existence seems at first to have been an outcome of the semi-independent, semi-national expeditions against Spain of

Drake, Hawkins, and Davis, for the early B. confined their operations to reprisals against Spain. In 1625 a band of Eng. and Fr. adventurers founded a settlement on St Christopher, from which they made cattle-hunting raids into Santo Domingo, drying the flesh and selling it to passing vessels. Their name of *boucanier* (French) came from the Indian *boucan*, a term used of the apparatus on which the meat was cured. In 1630 they removed to Tortuga del Mar, a small is. in the Bahama Channel to the NW. of Santo Domingo, which lay in the main route of trading vessels. They were joined by kindred spirits from all parts of the world, and for many years were a terror to Sp. ships and settlements on the neighbouring is. and mainland, the Sp. capture of the stronghold in 1636 having no permanent effect. Their early leaders included the Frenchman Montbars, known as 'The Exterminator,' L'Ollonais, and Peter the Great of Dieppe, the famous Welshman Henry Morgan, Michael de Busco, Bartolomeo el Portuguez, Manavelt, and Van Horn. In 1654 they captured and sacked New Segovia, in Honduras, and later plundered Maracaibo and Gibraltar, on the Gulf of Venezuela, and settled at Providence in the Bahamas. Their footing was still more firmly estab. in 1655 by the capture of Jamaica by the British, who lent them a kind of indirect support as fellow enemies of Spain. Operations from Jamaica were directed by Morgan, who seems to have possessed qualities of chivalry, valour, and brilliant generalship, as a set-off to his undoubted cruelty on many occasions. He was especially successful at the sack of Puerto Bello, but seems to have become too strong to please the British, as in 1670 a treaty to suppress buccaneering was concluded between Great Britain and Spain. Morgan's answer to this, in 1671, was to cross to the mainland with a fleet of 39 vessels, and, after marching across the Isthmus and fighting a pitched battle, to sack and burn Panama in circumstances of great barbarity. He later made terms with the Brit. Gov., was knighted by Charles II, and became deputy-governor of Jamaica. In 1680 the B. crossed the Isthmus of Darien, and, under the command of John Coxon, took Santa Maria and some Sp. vessels in the Bay of Panama. Then, while some returned to Jamaica, others, commanded by Sharp, Watling, and Hawkins, went through the S. Sea to Cape Horn, by which route they returned, laden with enormous wealth. In 1683 6 vessels of the B., under Van Horn, sacked Vera Cruz, while another section, under John Cook, went to Cape Horn, were joined by a vessel sent out from England under Eaton, and ranged the Pacific for 2 years, commanded by Davis and Swann. In 1685 they returned to Panama, and were joined by 2 other parties, a Fr. one under Grognet and L'Escurier, and an Eng. one under Towleley. This was the height of their power, for with wealth and security was arose and the French and Eng. separated. In 1688 an Eng. returned from plundering León and

Realejo, in Nicaragua, and some of its members joined a Fr. expedition against Cartagena. When the war between England and France broke out in 1689, however, the alliance came to an end, and the B. were harried by both countries. In 1697 an Eng. and Dutch fleet fought them off Cartagena, and after the peace of Ryswick in 1701 they gradually deteriorated into cut-throat desperadoes, without redeeming qualities. See W. Dampier, *Voyages*, 1697; J. Burney, *History of the Buccaneers of America*, 1816; J. Esquemeling, *Buccaneers of America*, 1678 (Eng. trans. 1741 and 1893); and the books on the subject by Wafer, Ringrove, Sharp, Thornburg, Archenholz, Stockton, Capt. Johnson, Pyle, and Haring.

Buccari, see BAKAR.



BUCCINA

Buccina, Rom. military brass wind instrument of the shrill horn or cornet kind in use in anct Rom. times. It was bent into the shape of the letter C, was about 12 ft in length, of narrow cylindrical bore, and blown by means of a cup-shaped mouthpiece.

Buccinator (Lat., 'trumpeter'), thin flat muscle of the cheek, forming the lateral wall of the mouth. It is so called because that part is distended in blowing a trumpet. Its action is to close the mouth (as in biting), to maintain the tone of the cheeks, and to prevent food collecting between the teeth and the lips.

Buccino, It. tn. in Campania (q.v.), 32 m. ESE. of Salerno (q.v.). It has a castle, old walls, and a Rom. bridge. There are quarries of fine marble near by. Pop. 6000.

Buccinum, see WHELEK.

Buccleuch Family. Anct and distinguished Scottish ducal house, tracing its descent from Sir Richard le Scott (1249-1286), who was famous in the reign of Alexander III of Scotland. The first of the family to receive the title of B. was Sir David Scott of Braxholm, who sat in James III's Edinburgh parliament of 1487 as 'Dominus de B.' The Sir Walter Scott of Braxholm and B., mentioned in Scott's *Lay of the Last Minstrel*, was his grandson, and lived about 1490-1552. He fought in the battle of Pinkie, 1547, and was killed in a skirmish with Sir Walter Kerr of Cessford, in Edinburgh. His great-grandson, bearing the same name, 1565-1611, was warden of the W. Marches, and was raised to the peerage in 1606 as Lord Scott of B. He is remembered for his rescue of 'Kinmont Willie' from Carlisle Castle, as well as for his services in the Netherlands, and in organising border bands for foreign service. The title of Earl of B. was bestowed in 1619 upon a Walter Scott who commanded a Netherland regiment against Spain. The first Duke of B. was James, Duke of Monmouth, the illegitimate son of Charles II, who received the title in 1663 on his marriage to Anne, Countess of B. When he was beheaded in 1685 the duchess retained the title in her own right. She was succeeded in 1732 by her grandson, Francis, as 2nd Duke of B. The present (1957) holder of the title is the 8th Duke of B. and 10th Duke of Queensberry. He succeeded to the title in 1935. Lady Alice Montagu-Douglas Scott (1901-), his sister, married the Duke of Gloucester on 6 Nov. 1935.

Bucconinae, see **PUFF-BIRDS**.

Bucentaur was a figure representing half a man and half an ass or bull. It was probably used as a figure-head for a ship. It was also the name of the state ship in which the dogs of Venice sailed every year on Ascension Day to the Adriatic Sea. He then performed the rite of dropping a ring into the water, thus wedding the sea in the name of the ro-p.

Bucephalus, favourite horse of Alexander the Great. B. d. in 326 BC, during Alexander's Indian campaign, and his master built the city of Bucephala in memory of him.

Bucer, or **Butzer**, Martin (1491-1551), Ger. Protestant reformer, b. Schlettstadt in Alsace. Becoming a Dominican in 1506, he was sent to study at Heidelberg, where he met Erasmus and Luther (qq.v.). In 1521 he apostatised from his order, and went through a form of marriage with a nun. Excommunicated in 1523, he settled at Strasbourg, where Henry VIII of England consulted him about the nullity. Having refused to sign the Interim of Augsburg (1548), he accepted an invitation in the following year from Crammer, and was installed as regius prof. of divinity at Cambridge. B. d. 3 years later, and was buried at Cambridge; but his body was subsequently disinterred and burned under Mary.

Buch, Christian Leopold von (1774-1854), Ger. geologist, b. Brandenburg;

studied in the School of Mines at Freiberg, and was a member of numerous learned societies besides holding an official position at the Prussian court. His pub. works are very numerous.

Buch, old dist. of France, a subdivision of Bordelais (q.v.), now in the dept of Gironde. The cap. was La Teste-de-Buch.

Buchan, Alexander (1829-1907), Scottish meteorologist, educ. at Edinburgh Univ., taught from 1848 to 1860, when he was appointed secretary to Scottish Meteorological Society. In 1878 B. became curator of library and museum of Royal Society of Edinburgh. His works include contributions to the *Challenger* expedition reports, 1889 and 1895; on *Atmospheric Circulation* and *Oceanic Circulation*; *Handy Book of Meteorology*; *Introductory Text-book of Meteorology*, 1871. He wrote the article on meteorology for the ninth ed. of the *Ency. Brit.*

His famous weather forecasts resulted from a long and careful scientific study of weather conditions in Scotland. He asserted that there were certain periods in the year when the temp., instead of rising, would remain stationary or would fall; others when, instead of falling, it would remain stationary or would rise. Two of the cold periods occur in the middle of May and from 11 April to 14 April; the April period consists of the 'borrowing days.' A recent examination of weather records did not support this hypothesis for London in the present cent.

Buchan was also a pioneer investigator into the Atlantic depressions and their influence on the climate.

Buchan, Anna, see **DOUGLAS, O.**

Buchan, David (1780-1837), Brit. naval commander and Arctic explorer. In 1811 he explored the Exploits R. in Newfoundland, and travelled about 160 m. into the interior. In 1818 he was in command of an Arctic expedition; he reached Spitsbergen with the *Trent* and *Dorothea* (see **BEECHER, F. W.**). Some years later he was lost at sea with the vessel *Upton Castle*.

Buchan, Elspeth (1738-91), Scottish religious enthusiast, founder of sect known as Buchanites. She claimed prophetic inspiration and divine powers. After separation from her husband she met the preacher Hugh White, 1783, and persuaded him to believe her the woman and himself the man-child of Rev. xii. The sect, always small, was banished from Irvine, 1784, and settled near Dumfries. Burns spoke slightly of it in a letter, 1784. Members enjoyed community of wives and goods. The sect became extinct in 1848. See J. Train, *Buchanites from First to Last*, 1846.

Buchan, John, 1st Baron Tweedsmuir (1875-1940), author and administrator. b. Perth, Scotland, eldest son of the Rev. John B. Educ. at Glasgow Univ. and Brasenose College, Oxford, he won the Newdigate Prize, 1898. In 1901 he became private secretary to Lord Milner, who was then high commissioner for S. Africa. He was home again in 1903, and became a director of the publishing house

of Nelson. During the First World War he was on H.Q. staff, 1916-17. In 1917 he became director of information. He entered Parliament as member for United Scottish Univs. at a by-election in 1927, became president of the Scottish Hist. Society, 1929-33, and was made a Companion of Honour, 1932. He was lord high commissioner to the Assembly of the Church of Scotland, 1933-4. He was raised to the peerage in 1935 when he succeeded Lord Hesselborough as Governor-General of Canada. As governor-general he was universally popular throughout Canada, where he made contact with all classes of the pop., and, despite recurrent ill health, travelled extensively. During his tenure of office he visited President Roosevelt, and in 1937 made a 10,000-m. journey into the Arctic circle and N. Brit. Columbia. In 1937 he was made a Privy Councillor, and in the following year, when home on leave, was installed as chancellor of Edinburgh Univ. Pubes. (mostly novels) include *Scholar Gipsies*, 1896, *John Burnet of Barn*, 1898, *The Half-hearted*, 1900, *The Watcher by the Threshold*, 1902, *The African Colony: Studies in Reconstruction*, 1903, *A Lodge in the Wilderness*, 1906, *Prester John*, 1910, *Sir Walter Raleigh*, 1911, *The Thirty-nine Steps*, 1915, *Greenmantle*, 1916, *Poems, Scots and English*, 1917, *Mr Standfast*, 1919, *A History of the Great War*, 1921-2, *Huntingtower*, 1922, *Midwinter*, 1923, *The Three Hostages*, 1924, *Lord Minto, a Memoir*, 1924, *John Macnab*, 1925, *The Dancing Floor*, 1926, *Witch Wood*, 1927, *Montrose*, 1928, *The Courts of the Morning*, 1929, *The Gap in the Curtain*, 1932, *Gordon at Khartoum*, 1934, *The King's Grace*, 1935, *The House of the Four Winds*, 1935, *The Island of Sheep*, 1936, *Augustus*, 1937, and *Sick Heart Riser*, 1941; also lives of Julius Caesar, Oliver Cromwell, and Sir Walter Scott. See his autobiography, *Memory Hold the Door*, 1940, and *John Buchan by his Wife and Friends*, 1945.

Buchan, Peter (1790-1854), collector of Scottish ballads, b. Peterhead, related to the Earl of Buchan. He learned printing and set up a press at Peterhead. His works include *Gleanings of Scotch, Irish, and English: Scarce Old Ballads*, 1825, and *Ancient Ballads and Songs of the North of Scotland*, 1828. The MS. of a further collection was ed. for the Percy Society by J. H. Dixon and pub. in 1845 as *Scottish Traditional Versions of Ancient Ballads*. Two other vols. remain unpub. in the Brit. Museum.

Buchan, dist. in the highlands of Scotland, lying partly in the NE. of Aberdeenshire and partly in Banffshire. B. Ness, about 3 m. S. of Peterhead, is the most easterly point in Scotland. The coastline is mostly high and rocky, and below the Ness, in the granite cliffs, there is a curious hollow, known as the Bullers (Boilers), some 200 ft deep, into which the sea rushes at high tide through a natural archway. The tns of Peterhead, Old Deer, and Fraserburgh are included in the dist. of B. The Comyns were earls of it till they forfeited the title in 1309.

There are sev. interesting ruined castles, and the remains of the abbey of Deer.

Buchan Ness, most easterly cape of Scotland, in Aberdeen co., sometimes called Boddam Point, with a lighthouse. Near by are the Bullers of Buchan (see under BUCHAN).

Buchanan, George (1506-82), historian and scholar, b. at Killearn, Stirlingshire, the son of a poor farmer. He was brought up in humble circumstances by his widowed mother. In 1520 his uncle sent him to the univ. of Paris. Five years later he graduated as B.A. from St Andrew's Univ., and in 1528 obtained his M.A. degree at Paris. For the next 3 years he was regent at the college of Ste Barbe. In Paris B. began to favour Protestantism, and his first poem, *Somnium*, which he pub. on his return to Scotland in 1537, was a bitter attack on the Franciscans. He followed this with *Franciscanus*, which expressed the sentiments of *Somnium* in bolder and more violent language. As a result, B. was arrested in 1539, but he escaped to France and became prof. of Latin at the college of Guienne, Bordeaux—an appointment which he owed to his friend, Andrew Govoa. While there he trans. Euripides' *Medea* and *Alcestis*, and wrote his 2 great tragedies, *Baptistes* and *Jephthes*. From 1544 until 1547 he taught at the college of Cardinal de Moine, Paris. Then, again through Govoa's influence, he was appointed lecturer at the univ. of Coimbra, Portugal. On Govoa's death he was at once exposed to religious persecution. He was confined in a monastery for a time, on the orders of the Inquisition, and there he began his famous Lat. paraphrase of the Psalms. On his return to Scotland, B. became classical tutor to Queen Mary (1562), and she gave him the revenue of Crossraguel Abbey. In spite of this he energetically supported the lords in their struggles against the queen. In 1567, shortly after Mary's imprisonment at Lochleven Castle, he was elected moderator of the General Assembly, having then definitely adopted Protestantism. With Moray, who had appointed him principal of St Leonard's College, St Andrews, in 1566, he attended the Conference of York, where Mary's alleged complicity in Darnley's assassination was discussed before Elizabeth's commissioners. In his *Delectio Mariae Reginae* B. stated in the strongest terms the lords' case against their queen, and his forcefully expressed views have influenced popular opinion on the subject ever since. In 1570 he was chosen as preceptor to the young James VI. In 1578 he resigned his position as keeper of the Privy Seal, and devoted his remaining years to his *History of Scotland*. B. was the most distinguished Brit. humanist of his day, and had a reputation throughout Europe. His *History* is a valuable contribution to literature. His account of contemporary events is of particular interest, although extremely biased. His tract *De Jure Regni*, in which he argued that sovereigns exist by the will and for the good of the people, had a profound influence on 17th-cent. statesmen. As a

writer B. shows himself possessed of a poet's imagination and a philosopher's power to think. See life by P. Hume Brown, 1890.

Buchanan, James (1791-1868), fifteenth President of the U.S.A., b. near Mercersburg, Pennsylvania; graduated at Dickinson College in 1809; called to the Bar in 1812. In 1813 and 1814 he was elected to the Pennsylvania legislature, and in 1821 became a member of Congress. In 1832 he was sent by President Jackson as minister to Russia, where he concluded a commercial treaty securing privileges for the U.S.A. in the Black and Baltic Seas. After his return in 1833 he was elected to the Senate, where he was a consistent supporter of Jackson and an advocate of the annexation of Texas. He left the Senate in 1845 to become secretary of state to President Polk, in which capacity he had to deal with the NW. boundary dispute with England. In 1853 he was sent by President Pierce as minister to Great Britain, where he was mainly engaged upon central Amer. affairs. In 1856 he was elected President of the U.S.A., in which office he supported the continuance of slavery, and was much influenced by the threats of secession of the S. states. He was succeeded by Lincoln in 1861, and retired into private life. In 1866 he pub. a defence of certain of his actions, entitled *Mr Buchanan's Administration on the Eve of the Rebellion*. See his life by G. T. Curtis, 1883.

Buchanan, Robert Williams (1841-1901), poet, novelist, and dramatist, b. Caverswall, Staffs. Educ. at Glasgow High School and Univ., he took up journalism in London together with David Gray (q.v.). His first collection of poems, *Undertones*, appeared in 1860, and was followed in 1865 by *Idylls and Legends of Inverburn*, and in 1866 by *London Poems*. These last, dealing with the life of the London poor, reach a very high level. His other poetical work includes *The Book of Orm*, 1870, *Balder the Beautiful*, 1877, *The City of Dreams*, 1888, and *The Wandering Jew: a Christmas Carol*, 1893. His verse exhibits considerable power, but tends to become assertive and egotistic. His chief success in the drama was *Sophia*, an adaptation of *Tom Jones*. *Lady Clare*, adapted from Ohnet's *Le Maître de Forges*, and *Joseph's Sweetheart*, adapted from Fielding's *Joseph Andrews*, were also well received. His novels once had a considerable reputation and include *The Shadow of the Sword*, 1876, *God and the Man*, 1881, *Alone in London*, 1884, *The Charlatan*, 1894, *The Strange Adventures of Miss Brown*, 1895, and *The New Rome*, 1899. He also wrote *The Land of Lorne*, 1871, *David Gray*, 1868, and *The Hebridean Isles*, 1882. Two reviews by him, 'The Fleshly School of Poetry,' attacking D. G. Rossetti, 1871, and 'The Voice of the Hooligan,' 1899, dealing with Kipling, roused much critical opposition.

Buchanan, extensive par. (41,000 ac.) in Strathgairn, Scotland, lying to the E. of Loch Lomond, mostly mountainous with little cultivation. Five of the is. in the

loch belong to B. par. B. Castle is a seat of the Duke of Montrose. Pop. 600.

Bucharest (București), cap. city of Rumania, on the R. Dimbovitza. It stands in a fertile plain, 265 ft above sea level. The city was much improved during the latter part of the 19th cent., and though the suburbs still contain many mean and narrow streets of an oriental aspect, the central part is mainly modern, being well paved, containing many handsome buildings, as well as sev. gardens and a famous public parade. B., which is the seat of the head of the Rumanian Orthodox Church, and also a Rom. Catholic episcopal see, is noted for its



Paul Popper

BUCHAREST: UNIVERSITY SQUARE

numerous churches. Among the most famous are the Gk cathedral, 1656, the Rom. cathedral, 1875-84, the Domnizza Balasa, St Spiridon, and the chapel of Stravropolos. Its univ. was founded in 1864. The royal palace, standing on the Calea Victoriei, was rebuilt in 1883. In the same street are the National Theatre and the post office, while other prominent buildings are the National Bank, on the Strada Lipsani, the Athenaeum, 1887, the Palace of Justice, Picture Gallery, Academy of Sciences, and Central Library with between 800,000 and 900,000 vols. The chief public gardens are the Cismegiu and the Kislov, traversed by the promenade known as the Chaussée, and there are some fine monuments, including those to Ion Eliade Radulescu and Michael the Brave. B. has a large trade as an exchange between Austria and the Balkan Peninsula, and considerable quantities of textiles, grain, hides, metal, coal, timber, and cattle, pass through it. Its pre-1941 manufs. included flour, beer, soap, candles, bricks, textiles, ironware, and chemicals,

and the transit trade in petroleum, timber, and agric. products is large. It is the centre of the national railway system. The climate is continental, with great extremes. From the end of the 14th cent. till 1698 B. was the residence of the Prince of Wallachia; in 1789 it was taken by Austria and held for 2 years; and it suffered from plague in 1794 and 1812, from earthquake in 1802, and from fire in 1847. It became the cap. in 1859. Treaties were signed here in 1812 between Turkey and Russia, in 1886 between Serbia and Bulgaria, in 1913 the one ending the Balkan wars, and in 1918 (see next article). The fortifications, constructed after plans by Brialmont during 1885-96, are very extensive, forming a circle over 40 m. in circumference round the city with 18 outer forts. But it was not possible to defend them during the First World War, and the city surrendered in 1916 without resistance to the Germans, who held it until 1918. There are air services to Belgrade and Istanbul. During the Nazi-inspired unrest in 1941 there was a rising of the Iron Guard in B., and large numbers of Jews were massacred in street fighting. During the westward advance of the Russian armies early in 1944 B. was heavily bombed by the Americans, notably on 4 April, when some 3000 persons were killed. The object of the raid was to disorganise transport and this was achieved. On the fall of the dictator Antonescu, the new gov. tried to 'liquidate' its relations with Germany, but the Ger. Army and Air Force in Rumania, disregarding assurances, attacked Rumanian army units and the civilian pop. in B. and elsewhere. The new gov. then turned its forces against the Germans, who were soon driven out of the cap. The Russians entered B. on 31 Aug. 1944. Pop. (1948) 1,042,000.

Bucharest, Treaty of (1918). Treaty signed between Rumania and the Central Empires on 7 May 1918. The Rumanian armies, after the defection of the Bolshevik forces from the Entente cause, rapidly gave way before the reinforced armies of von Mackensen. The defeat at Argos in Dec. 1916 and the loss of Tirgoviste, on the edge of the great Rumanian oil-field, rendered effective resistance ever more difficult. But the fighting dragged on for another 12 months, by which time B. and Braila had fallen to the Ger. forces, and the Rumanians were compelled to sue for an armistice. In May 1918 a treaty was signed at B. which in effect was a complete capitulation to Ger. demands. The treaty was of course nullified by the armistice of 11 Nov. 1918. For the T. of B., July 1913, see BALKAN WAR, THE.

Buchenwald, site of one of the main Ger. concentration camps (g.v.), situated near Weimar. The camp was started in 1934 by the Nazis. On 1 April 1945 the number in the camp was 80,813. A few days before the arrival of the Amer. forces (11 April) the Germans removed over 20,000 internees in order to prevent the Allies from learning too much about the camp. The internees, who included

persons of all European nationalities, comprised political prisoners and Jews from Germany; later, as the Reich expanded, political prisoners and Jews from Austria, Czechoslovakia, Poland, etc.; and, from 1940, men and youths imported for forced labour from occupied countries. It appears that up to 1 April 1945, the total number of those who had d. or been killed at B., or immediately on removal therefrom to subsidiary 'extermination camps,' was 51,572. Detailed camp records, including nominal rolls, were left behind by the Nazis. The Amer. medical and sanitary authorities were soon preoccupied with the cleaning of the camp, a task performed partly by Ger. civilians from the vicinity, parties of whom were brought daily to see what had been done in their name and in their midst. The impression gained by a Brit. parl. delegation which, at the invitation of Eisenhower and on the injunction of Churchill, visited B. on 21 April, even when conditions had been improved considerably in the meantime by the Americans, was of intense squalor, with an odour of dissolution and disease pervading the entire camp. Before the arrival of the Americans the number of deaths in the camp was about 100 a day. For those suffering from tuberculosis or dysentery there was a rough hospital hut 80 ft long by 24 ft wide, containing on an average a sick pop. of from 700 to 1300. Operations were performed without anaesthetics on a crude operating-table in full view of the other patients. Each night the dead were flung into a small annexe at one end of the hut and each morning collected and taken into carts to the crematorium or, if required as specimens, to the pathological laboratory of the Nazi doctors. Children in the camp were made to work 8 or more hours a day all the week. When the parl. delegation visited the camp there were still 800 children in it. Access to the basement of the mortuary block was by a steep stone staircase or by a vertical chute below a trap-door, down either of which refractory or useless prisoners were precipitated for execution. The 40 strong hooks for the gibbets were hurriedly removed by the Nazis before they left the camp. There was also a heavy wooden blood-stained club which was used for knocking out any who died slowly. To the yard outside the crematorium came the carts packed closely with the ordinary corpses from the dysentery and other huts, mostly stripped. Most of these appeared to have died of hunger or disease but not by violence. The delegation were told of scientific experiments, such as the infecting of prisoners with typhus in order to obtain serum from them, by the camp Nazi doctors. Various experiments in sterilisation were practised on Jews. Later the policy of exterminating the Jews superseded that of castrating them. It was the parl. delegation's considered and unanimous opinion, on the available evidence, that a policy of steady starvation and inhuman brutality was carried out at B. for a long period of time, and that such camps as B. marked the lowest point of degrada-

tion to which humanity had yet descended. (See Cmd. 6626, 1945, H.M.S.O.) B. was the first of the main concentration camps to be overrun by allied forces and so lent itself to speedy investigation; but other camps were equally terrible, and some even worse. These included, for example, Belsen, Auschwitz, and Dachau (qq.v.).

Bucher, Lothar (1817-92), politician, educ. at Berlin Univ. In 1848 he entered the Prussian national assembly, becoming an active leader of the extreme Democrats. In 1860 B. was charged with various political offences, and fled to England where he worked as a journalist. In 1860, on returning home, B. became Lassalle's literary executor. But his political views soon changed radically, and in 1864 he accepted a post in the Foreign Office from Bismarck, and became his private secretary. B. drew up the text of the N. Ger. Confederation constitution, and took part in many diplomatic missions.

Buchez, Philippe Benjamin Joseph (1796-1865), Fr. philosopher, b. Matagne-la-Petite; began to practise as a physician in 1825. He was concerned in the organisation of the Fr. Carbonari Society, being strongly opposed to the Bourbon restoration, and was arrested on a charge of conspiracy. Shortly afterwards he joined the Saint-Simonian Society, but left it in 1829 to found a Neo-Catholic school known as Buchezism, the doctrines of which he expounded in *L'Européen*, later called *La Revue nationale*, 1831-48. His philosophy is also described in *Introduction à la science de l'histoire*, 1833. After the revolution of 1848 he became deputy mayor of Paris, a member of the Constituent Assembly, and then president of that body. His other works include *Essai d'un traité complet de philosophie au point de vue du Catholicisme et du progrès*, 1839-40, *Histoire de la formation de la nationalité française*, 1859, *Traité de politique et de science sociale*, 1866, and, with Roux-Lavergne, *L'Histoire parlementaire de la Révolution française* (40 vols.), 1833-8.

Buchman, Frank Nathan Daniel (1878-), Amer. Protestant minister, b. Pennsylvania, Pennsylvania. From 1902 to 1907 he was in charge of a hospice for underprivileged boys in Philadelphia. In 1908, while at Keswick, Cumberland, England, he listened to a sermon about the Cross which changed his life. In 1921, believing that the world was at the start of a breakdown in civilisation, he resigned his univ. post to devote his life to creating an answer to this situation and forging a world force capable of bringing this answer to the world before it was too late. In that year he initiated the Oxford Group (q.v.) at Oxford, and in 1938 launched Moral Rearmament (q.v.). It is claimed that as the friend and adviser of statesmen and ordinary people in many nations, he has been responsible for the solution of political, racial, and industrial crises, and that his main contribution to this age has been the spread across the world of an ideology which is the superior alternative to Communism and anti-Communism. See his book, *Remaking the World*, 1953.

Büchner, Friedrich Karl Christian Ludwig (1824-99), Ger. physician and philosopher, b. Darmstadt; studied at Gießen, Strasbourg, Würzburg, and Vienna. In 1852 he became a lecturer at Tübingen, but the controversy raised by his *Kraft und Stoff*, 1855, made it necessary for him to resign and take up a private practice in Darmstadt. His later works include *Aus Natur und Wissenschaft* (2 vols.), 1862-84, *Der Mensch und seine Stellung in der Natur*, 1870 (Eng. trans., 1872), *Licht und Leben*, 1881, *Der Fortschritt in Natur und Geschichte im Licht der Darwinschen Theorie*, 1884, *Die Darwinsche Theorie* (5th ed.), 1890; also *Im Dienste der Wahrheit* (a selection of his posthumous essays with a memoir by his brother), 1899.

Buchu, or Bucku, see BAROMA.

Buck, Dudley (1839-1909), Amer. composer, b. Hartford, Connecticut; studied in Germany and France; returning to America he was organist at Hartford and Brooklyn. He composed church and other choral music, operas, cantatas, and also wrote some books on musical subjects. Best known among his works are the cantatas *Columbus*, 1876, *Golden Legend*, 1880, and *Light of Asia*, 1885.

Buck, Lafferto (1837-1900), Amer. engineer, famous as a builder of bridges, of which he constructed a number in U.S.A. and S. America. His most important achievement was his rebuilding of the suspension bridge at Niagara Falls.

Buck, Pearl (1892-), Amer. novelist, b. Hillsboro, W. Virginia. Her father, Absalom Sydenstricker, was a missionary, and she was educ. at a boarding school in Shanghai. In 1917 she married Dr J. L. B., a missionary, and lived in Nanking, where she taught English at the univ. Her first book, *East Wind, West Wind*, 1929, was followed by *The Good Earth*, 1931, which won the Pulitzer prize and the Howells medal of the Amer. Academy of Art and Letters, and led ultimately to her receiving the Nobel prize for literature in 1938. Others of her novels about China were *Sons*, 1931, *Dragon Seed*, 1942, *Peony*, 1948, and *The Child Who Never Grew*, 1951. *My Several Worlds*, 1955, is an autobiography.

Buck-bean, or *Menyanthes trifoliata*, is a European species of Gentianaceae. It is often called bog-bean.

Bückeberg, Ger. tn in the *Land of Lower Saxony* (q.v.), 30 m. WSW. of Hanover (q.v.). It was the former cap. of Schaumburg-Lippe (q.v.), and has a baroque palace, and a baroque Protestant church in which Herder (q.v.) was once court preacher. Pop. 11,500.

Bucket-shop, office of a share-broker who is not a member of the Stock Exchange, and, consequently, not subject to its rules and penalties, and whose deals in stocks and shares are usually speculative and may involve fraud. There are, however, 'outside' brokers who carry on a perfectly proper business. The term originated in the small lift or 'bucket' by which members of a gambling exchange reach a Chicago office.

Buckeye, common name given to certain species of *Aesculus* (q.v.). *A. californica*

is the Californian B., *A. glabra* the Ohio B., *A. ocellandra* the Sweet B., *A. parva* the Red B., all of N. America.

Buckfastleigh, urb. dist. of Devon, England, 7 m. N.W. of Totnes, in the valley of the R. Dart. Near by is Buckfast Abbey, rebuilt by the Benedictine monks themselves (the abbey church was erected between 1907 and 1938). Fossilised remains of prehistoric animals have been found in local caves. B. has the H.Q. of the Devon Spelaeological Society. Pop. 2600.

Buckhaven and **Methil**, joint burgh of W. Fife, Scotland, in the par. of Wemyss (q.v.), on the N. shore of the Firth of Forth. Coal is exported, and Methil (pop. 15,000), where a new dock was built in 1911, is one of the chief coal ports on the Firth of Forth. 'Redd coal,' known as sea-coal, has been washed ashore by the tide at Buckhaven, (pop. 20,241), covering the once sandy beach.

Buckhound, name applied to the stag-hounds at one time bred particularly for the purpose of buck-hunting. A royal pack was kept, and a nobleman held the mastership. In 1901 the hunt and mastership were abolished.

Buckhurst Hill, see CHIGWELL.

Buckie, chief tn of the fishing dist. from Banff to the mouth of the R. Spey, on the Moray Firth, in Banffshire, Scotland, with a fine harbour (area 9 ac.) and good quays. A substantial fleet lands white fish here, and there is an old-estab. connection with the herring fishery. Pop. 8000.

Buckie, see WHELEK.

Buckingham, George Villiers, 1st Duke of (1592-1628), courtier, b. Brooksby, Leics. In 1614 he was introduced at court, and, on the fall of Somerset, his good looks at once made him King James's prin. favourite. In 1618 he was created Marquess of B. and made duke in 1623. Remunerative offices and monopolies, gifts of rich lands, and the dowry of his wife, the Earl of Rutland's heiress, made him one of the wealthiest peers in the kingdom. B. soon acquired great influence over the Prince of Wales, whom he persuaded to accompany him to Madrid in 1623 in an attempt to further the projected Sp. marriage. His arrogance was one of the causes of the failure of the negotiations. The subsequent attempts of B. to win over public opinion by capturing Sp. treasure ships at Cadiz were abortive. In 1626 Charles dismissed his second Parliament, as it had instituted an impeachment of his favourite before the House of Lords. In 1627 B., having raised a forced loan, commanded an expedition to La Rochelle, to help the Huguenots. As the expected reinforcements never came, he had to abandon his siege in the Is. of Ré and return home in disgrace. On 7 June 1628 Parliament demanded the surrender of B., and to save his friend the king prorogued Parliament. Popular feeling ran high and lampoons against the duke were freely circulated. Finally, John Felton, a half-mad subaltern, assassinated him at Portsmouth, where he was about to embark for La Rochelle. He left 3 sons

and 1 daughter, of whom George, the second son (q.v.), succeeded to the dukedom.

Buckingham, George Villiers, 2nd Duke of (1628-87), courtier. After his father's death he was brought up with Charles I's children. He joined the Royalists in 1648, had his estates sequestrated, and took part, with Charles II, in the battle of Worcester. In 1657 he married Lord Fairfax's daughter, and at the Restoration recovered his lands. In 1674 he killed the Earl of Shrewsbury in a duel, while the countess, his mistress, is said to have looked on, disguised as a page. Four times imprisoned in the Tower for ridiculous exploits of ambition, he was partly responsible for Clarendon's downfall, joined the Cabal, and on its break-up in 1673 intrigued with the Whigs. Of his literary talent there can be no doubt; an example of this is his *Rehearsal*, a witty travesty of the stilted style of Dryden's tragedies. But he was destitute of principle, and was one of the wildest *roués* of a court the immorality of which is notorious. There is a brilliant, satirical sketch of him as *Zimri* in Dryden's *Absalom and Achitophel*.

Buckingham, James Silk (1786-1855), traveller and miscellaneous writer, b. near Falmouth, early adopted a seafaring life, visiting the W. Indies and America. Later he turned to literature, and in 1818 founded the *Calcutta Journal*, which was suppressed by the E. India Co., because in it B. agitated for a free press and various other reforms, including the abolition of suttee. From 1824 to 1829 he conducted the *Oriental Herald*, and by means of this and his lectures paved the way for the abolition of the company. He pub. sev. books of travel and an autobiography. His *Travels in Mesopotamia, 1827*, though now out of date, contains much valuable archaeological information. See R. E. Turner, *James Silk Buckingham*, 1934.

Buckingham and Chandos, Richard Plantagenet Temple Nugent Brydges Chandos Grenville, 2nd Duke of (1797-1861), only child of the 1st duke, known as Marquess of Chandos after 1822, and educ. at Eton and Oxford. He was M.P. for Bucks, 1818-39, and introduced the tenant-at-will clause into the Reform Bill of 1832, extending co. franchise to £50 (known as the Chandos clause). His estates were heavily encumbered, and his own expensive habits resulted in his becoming bankrupt for over a million, 1847. Many of his estates were sold, 1848, including his valuable collections of pictures, china, books, and furniture at Stowe. Among his works are *Memoirs of the Court and Cabinets of George III, 1853-1855*, *Memoirs of the Court of England, 1811-20, 1856*, and of courts of George IV, William IV, and Victoria, 1859-61. His *Private Diary* appeared 1862.

Buckingham (or Buckinghamshire) and Normanby, John Sheffield, 1st Duke of (1648-1721), son of the Earl of Mulgrave, he succeeded to his father's title in 1658, and served in the navy, commanding the expedition to relieve Tangier, 1680.

the divorce law, and introduced the Matrimonial Causes Bill. In 1929 he was chairman of the Political Honours Review Committee—a testimony to his integrity. Viscount, 1933.

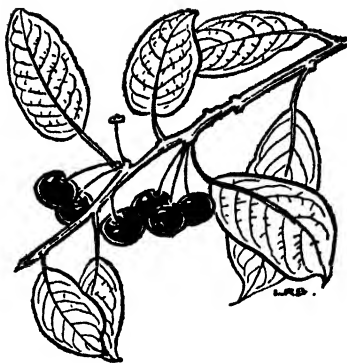
Bucknill, Sir John Charles (1817-97), physician, b. Market Bosworth, Leics. Educ. at Rugby under Dr Arnold and at Univ. College, London, qualifying in 1840. From 1844 to 1862 he was first medical superintendent of Devon Co. Asylum and there began his life's work. He advocated humane 'no-restraint' methods of treatment. In 1853 he founded the pioneer *Journal of Mental Science*, which he ed. until 1862; he was also a co-founder of the jour. *Brain*. In 1862 he became a visitor in lunacy. He was elected fellow of the Royal College of Physicians in 1859 and delivered its Lumleian Lectures in 1878. He was knighted in 1894. B. wrote *Unsoundness of Mind in Relation to Criminal Acts*, 1857, *Manual of Psychological Medicine* (with D. H. Tuke), 1858, *The Medical Knowledge of Shakespeare*, 1860, *The Mad Folk of Shakespeare* (2nd ed.), 1867, *Notes on Asylums for the Insane in America*, 1876, and *Care of the Insane and their Legal Control*, 1880. See *Dictionary of National Biography*, 1st supplement, vol. 1.

Buckram was once a rich woven cloth, considered especially suitable for church vestments. Thus the Bishop of Exeter, in 1327, presented his cathedral with banners of red and white B. To-day it denotes coarse linen or cotton fabric stiffened with glue or size. Its stiffness renders it useful for lining belts, collars, bonnets, etc., and also for bookbinding.

Buckskin, twilled cloth, made of wool, with the nap cropped off very finely. B. breeches are made of this material. It is also a soft leather made from sheep- or deer-skin.

Buckstone, John Baldwin (1802-79), dramatist, actor, and theatrical manager, b. Hoxton; was destined for the sea, but refused, and after a short time in a solicitor's office, took to theatrical pursuits. He joined a company of strolling players, and rapidly attained a reputation as a low comedian. In 1823 he first appeared in London as Ramsay in *The Fortunes of Nigel*; in 1824 joined the Coburg company, and in 1827 D. Terry's company at the Adelphi, appearing there in his own play, *Luke the Labourer*. His connection with the Haymarket began in 1833, and in 1853 he became manager there. His numerous plays were mainly successful owing to his knowledge of stage effect.

Buckthorn is the name given to various species of *Rhamnus*, the typical genus of the family Rhamnaceae. *R. cathartica* is the common B., with opposite leaves and thorny twigs; the berries have cathartic properties, and their juice is used in the manu. of sap-green. *R. frangula*, the Alder B., has scattered leaves; the wood produces a light charcoal used in making gunpowder, and the bark is cathartic. Both these species are natives of Britain. The Sea B., *Hippophae rhamnoides*, not



BUCKTHORN

related to the above, is a willow-like shrub with silvery leaves.

Buckwheat, or *Fagopyrum*, is a genus of Polygonaceae, closely allied to the rhubarb. It derives its name probably from O.E. *boc*, beech; cf. the Ger. trans. 'beech-wheat' in Barnaby Googe's version of Heresbach's *Husbandry*, 1577: 'I had rather call it Beechwhont, because the graine thereof is three-corned, not unlike the beechmast both in colour and form.' Beechmast was also called buckmast in O.E. At least 3 species of *Fagopyrum* are recognised: *esculentum*, *tartaricum*, and *emarginatum*, the first of these being the species cultivated in this country. B. is a native of central Asia and has been cultivated in Europe since the Middle Ages, primarily for its 'grain' but sometimes as a forage crop or green manure. B. is not a true cereal, and although it needs plenty of sunshine and warmth it will grow on much poorer soils than the true cereals. The grain has a thick, hard husk and is only fed in the whole condition to poultry. The crop is relatively unimportant in Britain, and is the sole representative in our cropping of an insignificant botanical family which, however, includes sev. important weeds such as docks, sorrels, black bindweed, and knot grass. As a cereal grown for human consumption in the form of B. cakes, B. is cultivated especially in N. America. B. flour is made from the 'seed' or kernel of the fruit. The chief states given to the cultivation of B. in the U.S.A. are Pennsylvania, New York, and Minnesota. The average yield for the whole of the U.S.A. is 14,000,000 bushels. In Canada the average yield is 10,000,000 bushels.

Bucolics (derived from the Gk word *boukolos*, a herdsman) has come to be a synonym for pastoral poetry (q.v.). Theocritus wrote a delightful collection of B., which breathes the simple charms of country life. B. is assumed to have been the title which Virgil originally gave

to his pastoral poems or *Eclogues*, wishing probably to invite comparison between his poetry and that of his famous rival. In the grammarians the B. of Virgil are also called *Eclogae*. The framework of Milton's *Lycidas* is bucolic, for the poet pictures himself and his friend as shepherds 'nursed upon the selfsame hill.' Ronsard gathered his eclogues together under the title *Les Bucoliques*, but otherwise the term has not been used by modern, as opposed to classical, poets. However, the adjective bucolic is frequently used to describe the character of such a work as Sidney's *Arcadia*.

Bucovina, see BUKOVINA.

Bud is the term used to indicate an undeveloped shoot. It is called a leaf-bud if it develops into a shoot bearing leaves, and a flower-bud if it bears a flower, which is really a modified shoot. If it appears at the apex of a stem it is said to be terminal, if in the axil of a leaf it is axillary or lateral, and if from any other part it is adventitious. If sev. B.s occur in the axil of a single leaf they are called *accessory* B.s. In some cases B.s remain undeveloped for a long time, when they are said to be latent, or dormant, and these are of great importance when frost has destroyed the early B.s. Winter B.s are often prevented from dying by loss of moisture by such developments as the secretion of resin, as in the horse chestnut, or a covering of hair, as in the willow. On the outside a B. is covered by overlapping B. scales, which represent modified leaves (as in lilac) or parts of leaves (leaf bases in horse chestnut, stipules in beech). The colour and shape of the B.s provide a useful means of identifying trees in winter; e.g. the black B.s of the ash and the cigar-shaped ones of the beech are quite characteristic. Water plants often hibernate in the form of special winter B.s (turiones). The Brussels sprout is an example of a large axillary B.

Buda, see BUDAPEST.

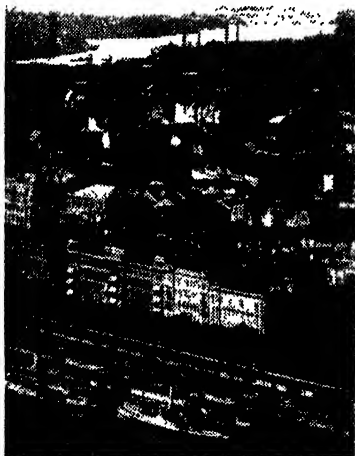
Budapest, cap. city of Hungary. It is in the N. of the country, at the W. edge of the Alföld (q.v.). The R. Danube (q.v.) divides the city into 2 parts: *Buda*, built on the hilly ground of the W. bank; and *Pest*, built on the plain land of the E. bank. This site, at an easy crossing of the riv., has been inhabited since early times; the remains of a Bronze Age settlement have recently been found, and there are also remains of Celtic settlements. In Rom. times an important tn, *Aquincum* (q.v.), developed on the W. bank; it decayed after the barbarian incursions, but it formed the core of a new settlement, *Óbuda*. *Óbuda* and *Pest* were devastated by the Tartars (q.v.), and Béla IV (q.v.) then constructed a new fortress at *Buda*, near the Gellért hill. Here also Sigismund (q.v.) later erected a palace, and *Buda* became the residence of the king. In the 16th cent. *Buda* and *Pest* were taken by the Turks, and they remained in Turkish hands until 1686, when, on the expulsion of the Turks, they came into the possession of the Hapsburgs (q.v.). Under the rule of Vienna, *Buda* expanded,

and many of the most notable buildings existing to-day, particularly those in the baroque style, date from this time. The growth of *Buda* was limited by the hilly nature of the ground on the W. bank, and in the early 19th cent. a great deal of building took place on the flat E. bank. *Pest*, previously undistinguished, now developed rapidly, although it was still a separate tn from *Buda*. Eventually, in 1872, the city of B. was formed by the unification of *Buda*, *Pest* and *Óbuda*. After the First World War B. suffered damage at the hands of the Bolsheviks (see BELA KUN), and, subsequently, at the hands of the Rumanians (see HUNGARY, *History*), who occupied the city Aug.-Nov. 1919. In the Second World War, B., garrisoned by Germans and Hungarians, was encircled by the Russians at Christmas, 1944, but it was not taken until 13 Feb. 1945 (see EASTERN FRONT IN SECOND WORLD WAR). During the 7 weeks of bitter fighting whole areas of the city were reduced to desolation, and scarcely a building in the city remained undamaged. At the end of the war B. was extensively reconstructed, but it suffered damage again during the anti-Russian risings of Oct.-Nov. 1956, when there was much fighting in the city.

Before the Second World War, the Danube at B. was spanned by 7 bridges; all of these were blown up by the Germans before the city fell to the Russian troops, but 6 have since been rebuilt and 2 new bridges have also been built. The riv. at B. divides to form 3 is.: Margaret Is. in the centre of the city, used as a park; Csepel Is. (q.v.) to the S.; and Szentendre Is. to the N. The part of the city on the W. bank, *Buda*, stands on and around 2 hills. One of these, the Gellért hill, is a rocky height rising 770 ft out of the riv. in the heart of the city. It is crowned with a citadel built in 1851 to replace a wooden Turkish fort. A pillar on which stands an immense statue, representing 'Liberty', now towers over the fort. N. of the Gellért hill is the *Várhegy*, the Castle hill, on the S. end of which stands the former royal palace: a neo-baroque palace built here in the 18th cent. by Maria Theresa (q.v.); it was enlarged at the end of the 19th cent. into a huge structure containing 860 rooms. During the Second World War the Germans held out for a long time on the *Várhegy*, and the dist. was, in consequence, the most severely damaged part of the city. The palace itself suffered grievously, but the slow work of reconstruction was begun soon after the end of the war. The bombardment of the hill laid bare the lines of the old ramparts and the remains of medieval buildings; in some places the streets and buildings of the hill have been reconstructed according to the medieval pattern. Among the other notable buildings on the hill is the Matthias church, or Coronation church (13th cent.; restored 18th-19th cents.) in which sev. kings of Hungary (including the Emperor Charles I, q.v.) were crowned. The riv. front on this side of the Danube has picturesque streets and many interesting buildings,

including the magnificent baroque church of St Anna (18th cent.).

On the E. side of the riv. the city is built to a roughly concentric plan, with 3 semi-circular roads, *Körúts*, the innermost of which encloses the *Belváros*, the oldest part of Pest. The outermost *Körút*, called the *Great Körút*, forms the E. boundary of the city, and is one of the main shopping centres of B. The *Körúts* are intersected by a number of straight roads running from the centre of the city; of these the most important are the *Rákóczi út* and the *Szédlán út*. The famous riv.-bank promenade, the *Corso*,



BUDAPEST

E.N.I.

is also on this side of the riv. Among the most notable buildings of the E. bank are the splendid neo-Gothic Parliament House (1884-1904), the dist. around which is the administrative heart of the country, the Academy of Sciences, the National Museum, and the State Opera House; all these buildings date from the 19th cent.

B. has a univ., a technical univ., and colleges of agric. sciences and economic science. There are iron and steel, textile, rolling-stock, motor-vehicle, chemical, electrical, paper, and brewing industries. Pop. 1,757,000. See C. Holland, *Hungary: the Land and its People*, 1935; E. de Megyery, *Budapest Scrap Book*, 1938; G. Pálóczy-Hirvath, *In Darkest Hungary*, 1945; Z. Hlász (ed.), *Hungary*, 1956.

Budd, William (1811-80), physician, b. N. Tawton, Devon; educ. in London, Edinburgh, and Paris. M.D., Edinburgh, 1838; gold medallist for essay on acute rheumatism. In 1839 B. began his life-work—study of the origin and transmission of typhoid fever. In 1842 settled

at Bristol, becoming physician to Royal Infirmary there, 1847-62. B. zealously promoted Bristol water-works, and did much for the improvement of sanitation. In 1873 ill health obliged him to give up practice. Chief work: *Typhoid Fever, its Nature, Mode of Spreading, and Prevention*, 1873. Others are *Malignant Cholera*, 1849, *Siberian Cattle Plague*, 1865, *Cholera and Disinfection*, and *Scarlet Fever and its Prevention*, 1871.

Buddh-Gaya, or **Bodh-Gaya**, vil. in Bihar state, India, dwelling-place of Buddha, resorted to by pilgrims as having once been the centre of Buddhist religion. There is a fine anc. temple, of which the shrine is now used by Hindus. It was built over an earlier temple of the time of Asoka.

Buddha and Buddhism. Buddhism is a religion that derives its name from its founder, Buddha, or, more correctly, 'The Buddha,' which means 'The Awakened' or 'The Enlightened.' Despite the fact that Buddhism numbers among its adherents about one-third of humanity, the amount of exact information concerning the foundation of this remarkable faith is far from exhaustive. There appears, however, to be a general consensus of opinion among orientalist that Buddhism had its origin in the N. of India in the 6th cent. bc from a Hindu prince named Siddhartha, or, as he is often called, Gautama. There are those who doubt whether Gautama (or Buddha) was an actual historical person, as there are those who question the historical existence of Christ; and it may be remarked that, as in the case of Christianity, the founder of Buddhism wrote nothing himself. It was only after his death that councils were held by the adherents of the new faith to settle the canon of its sacred writings and to fix its doctrine. These councils numbered three, the first being held by his chief followers immediately after the death of Buddha, in the 5th cent. bc. Schism and secession led to the holding, a cent. later, of a second council in order to uphold the doctrine against the schismatics; but it was not till 244 bc that Asoka, King of Magadha (now Bihar), summoned a third council to fix the canon more precisely. This was apparently not reduced to writing till about 150 years later, when the canon stood substantially as it does now. The sacred writings are divided into 3 parts (the Triptaka or 'triple basket'): (1) For the laity; (2) for devotees, i.e. monks, etc.; and (3) a metaphysical section. The prin. texts are the Sanskrit version of Nepal and the books of the Ceylon Buddhists in the Pali language (see PALI), and the Chinese trans. of Sanskrit MS. The story of the life of Buddha and a brief summary of his teaching is given in fluent verse by Sir Edwin Arnold in his *Light of Asia*, and may be briefly outlined here. Prince Siddhartha was the son of Suddhodana, King of Kapilavastu, a kingdom situated near the boundary of Oudh and Nepal. His mother's name was Maya, and according to some legends Buddha's was a virgin birth. The date of his birth has been

approximately fixed at 560-550 B.C. Many are the stories told to show how in early life the young prince evinced that preoccupation with the sufferings of all sentient beings which was to set him on his life's mission, viz. the search for the solution of the problem of pain. This preoccupation alarmed the king, for he feared his son would abandon his high station as ruler. In the belief that 'love will cure these thin distempers,' on the advice of his ministers the king married his son at an early age to Yasodhara, a beautiful princess. ('The thoughts ye cannot stay with brazen chains A girl's hair lightly binds.') She bore him a son and they lived together for 12 years (till Siddhartha was 30) in a most luxurious and closely guarded prison palace. But the prince's mind still dwelt more and more on mortal ills—the pain and vanity of existence from which even death offered no escape (for Buddha accepted as unquestioningly as his contemporaries the Brahmanic doctrine of the cycle of lives). At last, breaking from his triple-guarded prison, leaving his loved wife and child, he became a religious mendicant, and for 6 years, while practising a rigorous asceticism, he studied the teachings of the Brahmins. But he was unconvinced that the 'Path' was to be found in their teaching, and less still in the self-inflicted flesh-mortifying torture of the fakirs. About this time he underwent a severe test, Mara, the Prince of Darkness, seeking by fierce temptation to turn him from his quest. At last, after sitting under a tree for weeks plunged in profound meditation on the cause of things, Buddha emerged into that state of enlightenment in which he understood the cause of suffering and, consequently, its cure. The tree under which Buddha sat during his meditation is known to Buddhists as the Bodhidruma (the tree of intelligence). The spot on which this tree stood is believed by the devout to be the centre of the earth, and in the courtyard of an ancient temple in Bengal stands a pipul-tree which is claimed to be the descendant of the Bodhidruma (or, as it is sometimes called, the Bo-tree). The original Bo-tree was said by the Chinese priest Hsüan Chuang to be still standing 1200 years after the death of Buddha. The solution of his problem—the world's problem—having been vouchsafed, Buddha spent the last 40 years of his life in preaching his new gospel. He returned to his wife, who became one of his first converts; converted Bimbisara, King of Madagadha; and travelled widely in the N. of India. Buddha died at the age of 80 at Kusinagara (Oudh). From this time onwards, the new faith spread rapidly over the whole Indian peninsula, and in the 3rd cent. B.C. was carried to Ceylon. In A.D. 65, while Nero was persecuting Christians, Emperor Ming, of the later Han dynasty, sent his first Chinese envoys to India seeking the Buddhist faith; and 3 years later, with the arrival at Loyang of Indian monks, the first Chinese Buddhist temple, the White Horse monastery, was built in the Chinese cap. Thirteen different sects

developed in China, of which the *Ch'an* (Jap. *Zen*) school has been the most popular. From Ceylon Buddhism spread to Burma (5th cent. A.D.) and Siam (7th cent. A.D.). Its ever-zealous missionaries carried the tidings even further afield, and at the present day, although Buddhism is almost extinct in the country of its origin, being unable to compete with the old Hinduism, it is the most widely spread religion of Asia. In India the Nepalese and other Himalayan tribes are Buddhists, and Buddhism flourishes in Ceylon. Burma and Siam are still Buddhist, the majority of the Chinese, many of the Japanese, the Mongolian peoples of Tibet and central Asia, and even the Tartars of SE. Russia, are adherents of one form or another of this world-embracing faith. The number of Buddhists in Asia is estimated at 150,000,000 and there are said to be also 180,000 Buddhist inhab. of N. America, of whom about 11,000 dwell in Canada. In briefly describing the doctrines of Buddhism it will be well to compare them with the tenets of Christianity. Both systems realise the inadequacy of mundane existence; both may not unfairly be termed pessimistic; but the remedy of Christianity is 'life more abundantly,' while that of Buddhism is 'Nirvana,' or 'enlightenment through the denial of existence.' Holding that existence on the whole is an evil, and that death offers no release from existence—for incarnation but leads to renewed incarnation—the Buddhist ardently desires to escape from this cycle of lives, not by annihilation, as often erroneously alleged, but by losing his individuality in the universal life. 'The Dewdrop slips into the shining Sea.' The more man 'acquired merit' in his chain of lives the sooner was Nirvana attained. At the basis of Buddhism are the Four Sublime Verities taught by Buddha, viz. (1) that pain exists; (2) that it is brought about by attachment or desire; (3) that Nirvana alone can end pain; and (4) that the way to Nirvana is only to be attained by following the 'Eightfold Path': Right Doctrine, Right Purpose, Right Discourse, Right Behaviour, Right Purity, Right Thought, Right Lowliness, Right Rapture; and by acquiring merit by these means the Law of Karma ensured a more rapid release from 'life's fitful fever.' All the foregoing may be summed up in the word renunciation, i.e. freedom from *attachment* which alone causes existence. Attachment springs from desire, and desire from sensation, which in turn is the product of ideas. So that existence is the product of ideas. Buddha taught that ideas were mere illusions, and that if man will but free himself of his illudged ideas enlightenment can be attained. In order to achieve this one has to prove that nothing in the mundane world is not transitory and imaginary; for the knowledge of the world is based on perception, which in turn relies on our sense data—a factor subject to time and space, and therefore necessarily transitory and universal. In analysing 'consciousness' of the (illusory) existence of the world,

there was developed by later schools an elaborate system of epistemology or *wei-shih*, which was so abstruse that most Buddhists could hardly understand it. Consequently the more direct method of 'sudden awakening' taught by the *Ch'an* school has prevailed in China and Japan for the last 14 cents. Perhaps the most marked feature of Buddhism is not its fatalism, which it shares with other E. faiths, but the fact that the Law of Karma cannot be set aside by any divine

Buddhism. The erection of *stupas* over Buddhist relics, the foundation of monasteries, the *Chaityas*, or halls of worship, that were later built, the belief in a succession of Buddhas and Bodhisattvas or beings who in later ages will be Buddhas, the erection of images of the Buddha, are definite stepping-stones in the development of the religion. As might be expected of a religion that has altered so greatly and is professed so widely, there are numerous forms of Buddhism practised to-day. A



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THE TEMPLE OF THE WHEEL OF KARMA IN A PEKING MONASTERY

being. Buddha was not concerned to dispute the existence of gods, but they, if they existed, were as much subject to the cycle of change as was man. Some Buddhist nations have no word in their language for 'God' in the sense of being an arbiter of the fate of man. It may sound somewhat startling to assert that one-third of mankind is atheist, and it cannot be denied that Buddha is to-day worshipped and prayed to by multitudes of his followers, but the truth is that Buddha himself never claimed to be more than a man, and taught that a man's future was solely in his own keeping. The Buddhist religion as now practised is, however, very different from that preached by Buddha himself, and this is largely due to the competition for supremacy in India of Hinduism, Jainism, and

schism that occurred in the second century AD contributed largely to this: the Buddhist faith then divided into two schools, the Hinayana, or Little Vehicle, and the Mahayana, or Great Vehicle, the latter being cast in a somewhat Brahmanical mould. A Buddhist pantheon came into being; elaborate and beautiful temples and images were erected; elaborate and gorgeous ritual was practised. This is the school of Buddhism that is followed in Nepal, in Tibet, Mongolia, China, Japan, and Korea; the more southerly countries—Ceylon, Burma, Siam, Indo-China—follow the older Hinayana school. Though each belongs to the Mahayana school of Buddhism, there are, however, enormous differences between the Lamaism of Tibet and Mongolia, the Foism of China, and the Buddhism of Japan which has incorporated

more than a little of native Shintoism. Consult J. L. Burnout, *Introduction à l'histoire du Bouddhisme indien*, 1844; Sir E. Arnold, *The Light of Asia*, 1879; H. Fielding, *The Soul of a People*, 1898, and *The Inward Light*, 1908; W. A. Smith, *A History of Fine Art in India and Ceylon*, 1911; Sir C. Elliot, *Hinduism and Buddhism, an Historical Sketch*, 1921; A. Berridale Keith, *Buddhist Philosophy in India and Ceylon*, 1923; A. K. Coomaraswamy, *Buddha and the Gospel of Buddhism*, 1928; C. A. F. Rhys David, *The Birth of Indian Psychology and its Development in Buddhism*, 1936; Sir S. Radhakrishnan, *Eastern Religions and Western Thought*, 1939; G. Appleton, *Buddhism in Burma*, 1942; J. Blofield, *The Jewel in the Lotus*, 1948; Arthur Waley, *The True Tripitaka*, 1950; Chan Wing-tsit, *Religious Trends in Modern China*, 1953.

Budding is an operation in horticulture performed for the reproduction of plants and the formation of varieties. It can be done in many ways, but the plants which are concerned in the operation must be closely related botanically, e.g. roses bud upon roses, apples upon pears, apricots upon plums, or pears upon medlars. In shield-budding a bud from the wood of the present season's growth is cut from its parent in the months of July and Aug. when the bark separates freely from the wood. The operator then makes a cut in the shape of a T in the bark of the stock near the ground, slightly loosens the bark, raises it, and places inside it the bud. He then tightly binds up the bark above and below the bud with about a foot of raffia until the bud unites with the stock, when he removes the binding. If the operation is successful the tree which has been budded is cut short above the new member in the following spring, in order that all the strength from the root may be forced into the bud. By means of B., and other forms of grafting, woody plants can be propagated much more rapidly than they can be grown from seed. Moreover the seeds of many cultivated plants do not breed true, whereas B. gives plants which are exact replicas of their parents. See GRAFTING.

Buddleia, named after Adam Buddle, is a genus of shrubs and trees of the Loganiaceae. *B. globosa*, a native of Chile, is common in our gardens; *B. alternifolia*, *B. davidi* and its varieties, of China, are favourite hardy shrubs; *B. asiatica*, an E. Indian evergreen, is grown in green-houses.

Buddon Ness, cape on the E. coast of Angus, Scotland, with 2 lighthouses.

Budé, or **Budaëus**, Guillaume (1468–1540), Fr. classical scholar, b. Paris; studied there and at Orleans, devoting himself especially to Greek. He was secretary to Louis XII, librarian to Francis I, and provost of the merchants of Paris, and was also sent on sev. missions to Rome. He was a devoted student, and his numerous learned works include *Annotations in Pandecta*, 1508, the *De Asse*, 1514, and *Commentarii Linguae Graecae*, 1520, an extensive collection of lexicographical notes.

Bude, seaside resort on the N. coast of Cornwall, England. B. Castle was the residence of Sir Goldsworthy Gurney, who invented the Bude light. Pop. (with Stratton), 5300.

Budějovice, see ČESKÉ BUDĚJOVICE.
Budge, Sir Ernest Alfred Thompson Wallis (1857–1934), orientalist, b. Cornwall, and studied at Cambridge, where he won distinction in the Semitic languages. He conducted excavations at Aswān in Egypt, in the Sudan, and in Mesopotamia, and was later appointed keeper of Egyptian and Assyrian antiquities in the Brit. Museum. He was knighted, 1920. He issued numerous trans. from ancient Semitic tongues. His *Syriac Book of Governors of Thomas of Margā*, 1893, gives a vivid picture of 9th-cent. monastic life in Mesopotamia. Among his many other works are *Babylonian Life and History*, 1884, *The Ducclers on the Nile*, 1885, *The Rosetta Stone and Decree of Canopus*, 1910, *The Queen of Sheba and Menyelek*, 1921, *The Rise and Progress of Assyriology*, 1925, and *History of Ethiopia*, 1928.

Budgell, Eustace (1685–1736), essayist, b. St Thomas, near Exeter. Educ. at Christ Church, Oxford, he afterwards entered the Inner Temple, but soon gave up legal studies for literature. He was a cousin of Addison, and he took part in writing the *Taller*, contributed 31 papers to the *Spectator*, and also wrote for the *Guardian*. Later, he became under-secretary to Addison, chief secretary of the lords justices of Ireland, and deputy clerk of the council. When Addison became prin. secretary of state in England, he procured for B. the post of accountant and comptroller-general in Ireland (1717); but the next year B. pub. a lampoon directed against the Duke of Bolton and his secretary, E. Webster, which lost him his position. He was involved in the S. Sea Bubble, losing £20,000, and eventually he drowned himself in the Thames.

Budgerigar (*Macopsittacus undulatus*), Australian bird of the parrot family, Psittacidae. Popularly known as the lovebird. There are some 30 recognised shades of colour but among the more rare are white-lighted, opalines, and yellow-faced greys. See also PARAKEET.

Budget, account of the finances of a state, or, by analogy, of some smaller body, presented at a definite time by the responsible minister. Under the present procedure in Great Britain the chancellor of the exchequer presents his B. to the House of Commons during April. His statement falls into 2 parts: an account of the results of revenue and expenditure during the past 12 months, ending on 31 Mar., showing what surplus or deficit there has been compared with his estimates of the previous year; and an estimate of the revenue and expenditure for the ensuing 12 months, a balance being struck by the remission of old or the imposition of new taxes, with reference to the surplus or deficit on the past year.

Budissin, see BAUTZEN.

Budgeleigh Salterton, urb. dist. of Devon, England, 4½ m. E. of Exmouth, on the coast. It ranks amongst the most pretty

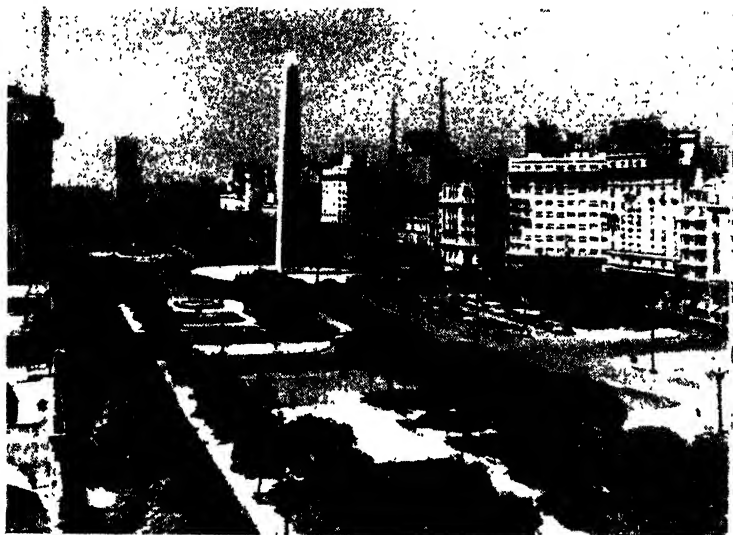
and secluded of Devon watering places, endowed with many natural beauties. Pop. 4000.

Budrio, It. tn, in Emilia-Romagna (q.v.), 10 m. E. of Bologna (q.v.). Pop. 18,000.

Budweis, see ČESKÉ BUDĚJOVICE.

Buell, Don Carlos (1818-98), Amer. military officer, b. Ohio. Graduated at W. Point, 1841; served in Seminole and Mexican wars, under Gens. Taylor and Scott. In the Civil war B. took part with Grant in the battle of Shiloh, and defeated the Confederate army at Perryville.

Buenos Aires: 1. The largest prov. of the Argentine Rep., having a coastline of 740 m. to the E. and S. on the Atlantic, from the mouth of the Plata to that of the Rio Negro, and bounded on the N. by the R. Paraná and the provs. of Santa Fé and Córdoba, and on the W. by the ter. of La Pampa and the prov. of Córdoba. It is for the most part a plain, well watered with rivers and lakes. Though many of these are useless for navigation, they add greatly to the fertility of the country, while the Paraná, with its estuary



B.O.A.C.

BUENOS AIRES

The Avenida 9 de Julio, which is reputed to be the widest street in the world.

Superseded for not following up his victory, he refused to hold further offices when offered to him. B. resigned his commission, 1864. He became president of Green River Ironworks, 1865-70, and engaged in mining enterprises. See J. B. Fry, *Operations of the Army under Buell*, 1884.

Buen Aire, or **Buen Ayre**, see BONAIRE.

Buenaventura, main port on the Pacific coast of Colombia on Cascajal Is., the terminus of a railway to Cali. The mean temp. is 85° and the average ann. rainfall 350 in. It exports gold, platinum, coffee, sugar, and hides. Steamers of sev. lines call here. Pop. 14,520. Rain falls nearly every day. B. was destroyed by fire in 1931, but has been rebuilt. The section of Pan Amer. highway between B. and Cali (Carretera al Mar) was opened in Jan. 1944.

the Plata, and the Rio Salado, are valuable navigable streams. The only hilly country occurs in the extreme S. of the prov. The climate is mild, being considerably tempered by the Atlantic breezes. The main drawback is the Pampero, a destructive hurricane which blows from the S. in the summer. The soil is very fertile, and cereals (including half Argentina's wheat), tobacco, and fruit are grown, but cattle-grazing (there are some 15,000,000 head of cattle here, one third of the cattle of Argentina) and sheep-rearing (18,000,000) are the prin. industries. The affairs of the prov. are administered by a governor and vice-governor, and a congress, all completely independent of the central gov. The chief tns are the Federal cap. B. A., the prov. cap. La Plata, Zárate, and Bahía Blanca. Area 116,332 sq. m.; pop.

(excluding the city of B. A.) 5,023,264 (1955).

2. The Federal cap. of the Argentine Rep., on the W. bank of the Plata, 150 m. from the sea. Greater B. A. is now called the Federal District, with an area of 77 sq. m. The Plata is here almost 30 m. wide, but very shallow, so that the 2 entrances to the docks have to be kept open by continual dredging. The city stands on a level plain, very little above sea level, and has a mild and moist climate. There is a luxurious splendour about the city, with its sunny boulevards (the chief being the Avenida de Mayo) lined with imposing buildings. Belgrano is the finest of its many suburbs. The streets are regularly laid out at right angles to each other and well lighted. Many are planted with trees, and there are numerous open squares and sev. fine parks, the most famous being Palermo Park (840 ac), which has a motor track and flying ground. The main buildings are the Rom. Catholic cathedral dating from c. 1600, the chapel of Santa Felicitas, the Casa Rosada, or Gov. House, the univ., the opera house, and various gov. and municipal buildings and first-class hotels. B. A. is the terminus of the railway lines, and has excellent tramway, cable, and telephone services, and a fine modern airport. Sev. thousand head of cattle are killed and chilled daily in some of the slaughter-houses in the vicinity. The city has been virtually rebuilt since 1900. Avenida 9 de Julio is the widest street in the world. In a normal year over 3500 ships enter and leave the port of an aggregate of more than 20,000,000 tons of cargo, nearly a third of which is Brit. The municipal gov. is exercised by a mayor appointed by the president of the Argentine Rep. with the approval of the Senate; he is assisted by a council of 30 elected members. The univ., which has an average of over 20,000 students, was founded in 1821. There are 30 theatres. There is a museum and a national meteorological bureau. Air routes for mails and passengers radiate from B. A. to many stations in the Argentine Rep. and to other countries. B. A. prospered, as indeed did so many S. Amer. cities, throughout the Second World War period. The life of the city is comparable to that of Paris before 1914, and its seaside resort of Mar del Plata adds to its attractions. The suburbs of B. A. on Saturdays and Sundays give the impression of one huge sports club, where thousands of young men and women take part in every kind of game and exercise under the best possible conditions. The Club de Gimnasia y Esgrima, with a membership of 30,000, gives for a small subscription gymnasia, swimming baths, fencing, boxing, pelota courts, music and foreign language teachers, a library, and ballroom. Pop. 3,554,906.

Buff, Charlotte (1753-1828), famed in Ger. literature for winning Goethe's love, b. Wetzlar. In 1772 Goethe visited Wetzlar, was often at her father's house, and fell deeply in love with Charlotte,

who was engaged to Kestner and married him 1773. She was the prototype of his heroine in *Leiden des jungen Werthers*, 1774. Thomas Mann described an imaginary meeting of Charlotte and the old Goethe in his *Lotte in Weimar*, 1939.

Buff Leather, flexible dry cream or white leather made from cattle hides. The grain layer of the hide is removed, the leather is oil tanned (see **LEATHER**) with cod oil, and the surface finely abraded with pumice and sand to produce a velvet-like nap. It is not frequently encountered nowadays, but is used for soldiers' ceremonial belts, facings, and other purposes, and occasionally in luggage.

Buffalmacco, Buonamico (1262-1340), early Florentine painter. He was a disciple of Andrea Tafi, and to him are attributed some fading frescoes in the old Badia Church in Florence. He is better known through Boccaccio and Sacchetti as a wit and practical joker.

Buffalo, city, co. seat of Erie co., New York, U.S.A., twelfth largest city in U.S.A., founded under the name of New Amsterdam in 1803 by Joseph Ellicott, agent of the Holland Land Co., slopes upon the NE. extremity of Lake Erie. Until 1810 it retained its original name; tradition derives its present name from the herds of buffaloes that used to frequent the Buffalo Creek region. The greater probability, however, is upon the side of its derivation from the name of an Indian chief. All but destroyed in 1813 by a Brit., Canadian, and Indian force, it rose to the rank of a city in 1832, and in 1853 annexed its erstwhile rival, Black Rock. With the completion of the Erie Canal in 1825, B. rapidly advanced into the forefront of commercial importance. It has direct passenger and freight connection with the great ports of the lakes; it distributes the manuf. products of the E. to the W., and the raw products of the W. to the E.; it stands as a junction between ship and rail; and it is the port of entry of the Buffalo Creek customs dist. Ten thousand ships enter its harbour yearly, and barges up to 2000 tons ply the canal from B. to the sea. The city has fine airport facilities, and many railways meet there. It is among the prin. grain and flour markets of the world. In B. in 1843 Joseph Dart constructed the first grain elevator. Among its manufs. are foundry and machine shop products, linseed oil, cars and ship construction, soap and candles, flour and grist mill products, lumber and planing mill products, clothing, iron and steel products. Its industries include printing, publishing, meat-packing, petroleum-refining, ship-building, brick, stone, and lime working, lithographing, the making of patent medicines and chemicals, copper smelting and refining. Its altitude, temperate climate, excellent drainage, and water supply make B. an attractive, residential city, with a pop. which has steadily and rapidly increased. It is second in pop. in New York state. It is beautifully laid out with spacious streets, most of which are bordered with trees,

and with squares, and is encircled by 1030 ac. of parks linked together by boulevards and driveways. Here are the univ. of R., Canisius College, D'Youville College, and a Catholic teachers' college, also the Grosvenor Library, Albright Art Gallery, City Hall (1932), Prudential Building, and Larkin Building (designed by Frank Lloyd Wright). On 7 Aug. 1927, the International Peace Bridge, connecting B. with Fort Erie, Canada, was dedicated in the presence of the Prince of Wales and the Brit. Prime Minister. Pop. 580,132.

Buffalo, Eng. name of *Anoa* and

rugose mass impenetrable to bullet, and extending to the back of the head, then spreading horizontally and curving upwards and inwards to the tips, which are usually some 4 ft apart. Like the Indian B. it is fond of water, which it visits at more or less regular intervals during the 24 hours, and has a habit of plastering its head with mud which, when dried by the sun, acts as a protection from the sting of the gadfly. The African B. is the most formidable of the large game of S. Africa and is both fierce and untameable. The Amer. bison, belonging to a different genus and distinguished by



National Film Board, Canada

BUFFALO IN ELK ISLAND NATIONAL PARK, ALBERTA

Syncerus, genera of large ruminant mammals, belonging to the family Bovidae or ox family, and found chiefly in India and Africa. It is distinguished by its somewhat triangular horns, which arise close together from flattened bases set low in the skull. The Indian B. (*A. bubalis*) or Indian water B. is a heavy animal, with thick hide covered sparingly with coarse black hair, usually with long horns compressed at the base and curved in the form of a half-moon and set on a straight head, with small ears. It lives in herds in the jungles of the plains, and there are domesticated breeds. The African or Cape B. (*S. caffer*) is almost equal in size but not so heavy as the Indian B., though fully equal in strength and courage to its Indian congener, from which, however, it is easily distinguished by the fact that its horns are immensely broad at the base, where they approximate so closely as almost to meet, thereby forming, particularly in old bulls, a solid

its humped body and small horns, is often termed a B. (see BISON).

'Buffalo Bill,' see CODY, WILLIAM FREDERICK.

Buffon, George Louis Leclerc, Comte de (1708-88), Fr. naturalist, was of rich and noble parentage. His life was rigorously devoted to science, but for some time he studied law at the Jesuit College in Dijon. Here he met Lord Kingston, in whose company he toured in France and Italy, and travelled to England. Having built up a reputation as the translator of Newton's *Fluxions* and Hales's *Vegetable Statics*, he was appointed keeper of the Jardin du Roi, the Fr. zoological gardens. It was probably this appointment which induced him to embark on his colossal *Histoire naturelle* (1749-87), in which Daubenton and others collaborated. Although its style is often turgid and ultra-rhetorical—it was this which Rousseau and his other contemporaries at home and abroad so frankly admired—it was, in

spite of its many unsupported hypotheses, the first work to suggest the existence of evolution in the animal world. Inspired by a genuine love of learning, he undoubtedly raised the status of biological science. His membership of most of the learned societies of Europe attests his wide reputation. See L. Roulé, *Buffon et la description de la nature*, 1924.

Bufs, The (Royal East Kent Regiment), formed in 1665 from Eng. troops previously in the service of Holland. The regiment can thus claim a link with the Eng. volunteers who joined the Dutch forces in 1572. It ranks third among the regiments of the line. It was first known as the Holland Regiment. Served under William III in Flanders; in Cadiz expedition 1702; then, under Marlborough, at Blenheim, Ramillies, Oudenarde, and Malplaquet, and in 1743 under George II at Dettingen. It served with distinction under Wellington in the Peninsula. It also bears honours for Punniar, Crimean War, China War, S. Africa, 1879 and 1899-1902, and Chitral. During the First World War it raised 16 battalions, which served in France, Flanders, Macedonia, Palestine, and Iraq. In the Second World War the B. were part of the famous Eighth Army (q.v.) in Italy and were in severe fighting at Termoli (Oct. 1943) and around Biferno, and later in battles across the Trigno R. A unit of the B. formed part of the Brit. garrison in Leros during the war. A battalion of the B. was one of the first to break through the Hitler line on the It. front in 1944, and a rifle battalion took the major part in clearing the Germans from the Tavignano area. Other units fought in Mukhya in 1941-2. The B. have been associated with E. Kent since 1782. The King of Denmark is colonel-in-chief of the regiment. Danish volunteers served with the regiment in the Second World War. The 2 Kent regiments, the Bufs and the Queen's Own Royal West Kents, are to be amalgamated by 1962. See Knight and others, *Historical Records of the Bufs*, 1905-51.

Bufo is the typical genus of the toad family Bufonidae, species of which are found all over the world except Madagascar and Australia. *B. vulgaris* is the common toad of Britain; *B. calamita* is the natterjack. See TOAD.

Bug, name of 2 rvs. in E. Europe. 1. The S. B. (Ukrainian Boh) rises in Podolia and flows SE. into the Dnieper estuary of the Black Sea. Length, 415 m. Chief port, Nikolayev. It formed the demarcation line between the Ger. and Rumanian zones of occupation 1941-3.

2. The W. B., a right trib. of the R. Vistula. It rises in Galicia, forms part of the frontier between Russia and Poland, and joins the Vistula near Warsaw. Length, 440 m. Chief port, Brest.

Bug is a term variously applied to all members of the order Hemiptera, or Rhynchota, or to those only which belong to the section Hemiptera-Heteroptera. Little is known about many of them, but over 20,000 species from all parts of the world have been classified. As they all

feed on the juices of plants or the blood of mammals, they are extremely injurious to the human race. The chief characteristic of B.s is the sucking or biting mouthparts, which are in the form of a proboscis or beak. The wings, which are absent in some species, e.g. *Cimex lectularius*, are nearly always 4 in number. The anterior pair in the Heteroptera have the distal half membranous and the basal half thickened, while in the Homoptera they are of the same consistency throughout. A great many of these pests are provided with *stink-glands*, which emit an extremely unpleasant odour. The rate at which they increase is enormous and it may here be noted that *Acanthosoma griseum*, a field-bug, is one of the few insects which protect and care for their young. The botfly (q.v.) is an aquatic species which preys on insects and fish; members of the family Cuspidae feed on fruit, lothens, and grass, and cause the 'buttoning' of strawberries; others which are vegetable-feeders surround themselves with a foamy mass known popularly as 'frog-spittle'. The bed-bug is a well-known creature which infests man, preying on him by night and sucking his blood; the cinch-bug (*Blissus leucoplerus*) sucks the juice of plants; the squash-bug (*Anasa tristis*) feeds on squashes and pumpkins; the cotton-stainer (*Dysdercus suturalis*) injures cotton; the family of Aradidae live under bark; and *Halobates* is a marine genus. When used in its widest sense, the term B. includes the aphidae (q.v.), cochineal, and lac-dye insects.

Buga, mkt tn of Valle del Cauca, W. Colombia, on the railway from Cartagena to Buenaventura. Agric. and cattle-raising centre. Pop. 19,600.

Bugaeu, see BULG.

Buganda, prov. of the Uganda Protectorate, inhabited by the Buganda, a Bantu-speaking people. It is recognised as a native kingdom under its ruler, the *kabaka*. It comprises the dists. of Mengo, Masaka, and Mubende, together with 5 is. in Lake Victoria. These is. were entirely depopulated through epidemics of the sleeping sickness at about the time of the First World War, and instead of the former pop. of 3,000,000 there are now only about 850,000 in the whole of B. The area is 25,390 sq. m., of which 8,320 sq. m. is water. Compared with other parts of Africa, the people have a high literacy rate. They are extremely intelligent and more advanced politically than most tribes. A large percentage is said to profess Christianity, but it is also true that witchcraft is widespread. The Buganda are essentially agriculturists. Their staple diet is banana. B. is the richest area of Uganda, and attracts great numbers of labourers from surrounding tribes. The township of Mengo is the seat of the native gov. Kampala, in the Mengo dist., is the commercial centre of the protectorate. The conurbation of which it is the nucleus comprises a number of hills each tending to be appropriated to some special purposes: Nakasero, the gov. residential area at its foot, and on its summit the remains of the old gov. fort;

Kilolo, which has a wireless station; Rubaga, Rom. Catholic cathedral and H.Q. of the White Fathers; Makerere, where is the new college of almost univ. status and other gov. educational establs. In the tu of Kampala itself the outstanding buildings are the high court fronted by gardens in which is the war memorial, the gov. Indian school in old Kampala and the agric. laboratory. In the dist. of Masaka is the Buddu low-lying forest land; Muhende is a scrub-covered, scantily populated area but contains a quantity of game, particularly elephants and buffalo in Buyago and N. Singo. Brit. influence in B. came in 1890. As with other Europeans who had been in the country, they were struck with its highly developed kingship. Under the king, who has complete ritual and political power, are co. (*saza*) and sub-co. (*Gombolola*) chiefs appointed by him to rule over the peasants. The *kabaka* is assisted in gov. by 3 ministers and the *kukiko* (council or parliament). There was an elaborate system of tribute, an efficient judiciary, a form of conscription, and a census. In 1890 the Brit. E. Africa Co.'s officers, after Germany had repudiated the activities of the notorious Carl Peters (who had tried to extend Ger. influence by concluding a treaty with the King of Uganda) became the accepted advisers of the *kabaka*. The officers rendered heroic service in establishing peace and order, and in 1893 the whole of Uganda became a Brit. protectorate. The British preserved the monarchy of B., doing everything possible to promote its usefulness. In 1903 B. became the centre of controversy when the *kabaka*, Mutesa II, was exiled by the Brit. Gov. on the grounds that he had failed to carry out his obligations under the agreement of 1900, by which the Brit. Gov. agreed to recognise the *kabaka* as long as he co-operated loyally. Moreover, he had stated publicly that he would oppose the declared policy of the Brit. Gov. The *kabaka* contended that the Brit. aim of an E. African Federation would be detrimental to B., and practically demanded independence for B. within the Commonwealth within a specified time. As a result of a conference (1954) at Namirembe, constitutional arrangements were arrived at which were approved by the Brit. Gov. and the B. *kukiko*, and the *kabaka* was allowed to return in Oct. 1955. See J. H. Speke, *Discovery of the Source of the Nile*, 1863 (in Everyman's Library); J. Roscoe, *The Baganda*, 1911; L. Mair, *An African People in the Twentieth Century*, 1934; A. I. Richards, *Economic Development and Tribal Change*, 1955.

Bugasóng, or **Bugasan**, coast tn on W. of Panay, Philippine Is., about 30 m. from San José de Buenavista. It grows hemp and rice. Pop. 15,642.

Bugayev, see **BELYY**.

Bugeaud de la Piconnerie, Thomas Robert (1784-1849), Fr. soldier, who rose from private to the rank of colonel. He took part in the Napoleonic wars; in 1815 commanded the advance guard of the army corps of the Alps. Chosen deputy

for Périgueux in the July revolution of 1830. Afterwards created marshal by Louis Philippe, who sent him into Algeria to quell the Arabs, 1837. He was appointed Governor-General of Algeria in 1840, when he organised the famous Zouave regiment; after his subjugation of the Moors in 1844, received the title of duc d'Isly. Died of cholera. See *Memoirs* 1884.

Bugenhausen, Johann (1485-1558), Ger. reformer, b. Wollin, Pomerania; studied at Greifswald; ordained 1509. In 1520 he was converted to Lutheranism by reading Luther's *De Captivitate Babylonica*. He matriculated at Wittenberg in 1521, and helped Luther in his trans. of the Bible. In 1524 he wrote a commentary on the Psalms, and from 1537 to 1542 was organising the reformed church in Denmark.

Bugey, dist. in France, in the old prov. of Burgundy, now part of the dept of Ain. Its cap. was Belley.

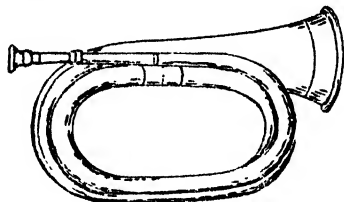
Bugge, Elseus Sophus (1833-1907), Norwegian Germanist and philologist, b. Laurvig; educ. at Christiania, Copenhagen, and Berlin. In 1866 he became the first occupant of the chair of comparative philology and Old Norse at the univ. of Oslo. His numerous authoritative works on Norse literature and archaeology, and Germanic philology, include *Norroen Fornkvæði*, an ed. of the Edda songs, 1867, *Norroene Skrifter af sagnhistorisk indhold*, an ed. of the *Volunga* and *Hervarar* sagas, 1864-73, and *Lyktische Studier*, 1897 (Eng. trans., 1899).

Buggy, light vehicles for 1 or 2 persons, especially in the U.S.A., India, and the colonies. Those formerly much used in America had 4 wheels and were drawn by 2 horses or sometimes 1. Another type of B., less popular, had 2 wheels only. One kind, the Indian, is fitted with a hood, while the Amor. B. was either covered with a hood or open. The origin of the name is unknown.

Bugis, people who inhabit the S. of the Celebes Is., Indonesia, also Borneo and the Philippines. They are of Malayan origin and are Mohammedans. Formerly well known as pirates and travellers, they now trade in cloth and are noted ship-builders and filigree workers.

Bugle, wind instrument, made of copper, with pieces of brass soldered on to the most exposed parts to prevent wear. Compared with the trumpet, its tube is shorter and more conical, and the bell less expanded. As its notes are peculiarly penetrating, it has been widely adopted for giving directions to large or scattered bodies of troops. Used at first for infantry only, it has now supplanted the trumpet for cavalry and artillery too. It is in the key of B \flat and treated as a transposing instrument, so that its notes are written in the key of C, sounding a whole tone lower. Having no valves, it can produce only the 'open' notes of the natural harmonics which are employed for military signals. The written notes are C (below the treble staff), G, C, E, G. The 3 other notes, C (octave lower), and B \flat and C above, are somewhat ineffectual.

The cornet has now quite superseded the Kent B., which was fitted with keys to increase its compass, and which at one time was one of the most popular instruments in brass bands. The B. calls, contained in the drill manual, are known alike to officers and to the rank and file. One G signifies 'right,' 2 Gs 'centro,' and 3 Gs 'left,' while more elaborate calls mean 'Advance,' 'Cease Fire,' 'Assemble,' 'Charge,' etc.



Bugloss, popular name of certain plants of the family Boraginaceae. The plant particularly known as B. is the ann. herb, *Lycopsis arvensis*, one of the weeds of cultivated ground. The B. grows wild in meadows or fields to a height of about a foot, bearing clusters of blue flowers. The plant is covered with sharp bristles. The name B. is also applied to *Ichium vulgare*, or viper's B. (q.v.).

Bugul'ma, in the Tatar Autonomous Rep. (Russia), 140 m. SE. of Kazan', in Tatar-Bashkir oilfields. It has oil-extraction (since 1949) and food industries, and is a local cultural centre. Pop. (1956) 53,000 (1926, 14,000). It was founded in 1741. B. was cap. of B. Oblast within Tatar Rep. 1952-3 (abolished).

Buhl Work, or **Boule Work**, kind of marquetry invented by a Fr. cabinet-maker, André Charles Boulle (1642-1732). It consists of a skilful inlaying of tortoiseshell, enamel, rosewood, and various pierced metals, and has a highly decorative effect when applied to ornamental pieces of furniture. Boulle was patronised by Louis XIV, and his work is still valued by collectors.

Buhrstone, or **Burrstone**, siliceous rock deriving its name from the rough surface presented. It is largely used for millstones and for grinding.

Builder, person who builds. It is incorrect to apply the term to the person who commissions and pays for a building—he is the 'building owner'; the term is also often applied incorrectly to masons and bricklayers.

In modern practice there are 3 types of B.: (i) the building contractor, who employs masons, bricklayers, carpenters, plumbers, painters, etc., and undertakes contracts to erect buildings; (ii) the jobbing B., who undertakes small jobs in all trades, but without a binding contract; and (iii) the speculative B. who erects houses or other buildings as a speculation at his own risk, on land that

he has bought, in the expectation of making a profit by selling each house and its site to prospective purchasers. Speculative building has been practised in England since the 17th cent. The Institute of Builders has its H.Q. in London. There are also federations of employers and operatives.

Building. Provision of shelter for man and his goods comes second only to the provision of food, both in hist. and in economics. The basic and universal requirements of the B. are that it should be structurally stable and that it should provide protection from the weather. In temperate climates, with the advance of living standards, almost equal importance attaches to other requirements such as heat and sound insulation, fire protection, and sanitation. The structural components may be as simple as the tent pole or as complex as the modern steel or reinforced concrete skeleton. Between these extremes is the most common structural system: load-bearing walls supporting a roof carried on beams or trusses. Since the Second World War methods of prefabricating sections of B.s. in timber, reinforced concrete, or light metals have been widely developed. Another important development has been the drawing up, originally under the supervision of the Ministry of Works, until responsibility was transferred to the Brit. Standards Institution, of a comprehensive system of Codes of Practice. These Codes aim at standardising good practice in all details of the design, construction, and servicing of B.s. See also ARCHITECTURE; DOOR; ROOF; SANITATION OF BUILDINGS; SOUND INSULATION; WALLS; WINDOW; and articles on various B. trades and materials. Consult C. C. Hardsyde, *Building Materials, Science and Practice*, 1950; W. F. Cassie and J. H. Napper, *Structure in Building*, 1952; G. A. and A. M. Mitchell, *Building Construction and Drawing*, 1956; R. Llewellyn Davies and D. J. Petty, *Building Elements*, 1956.

Building By-laws. With the object of securing a measure of conformity with sanitary principles in the construction of buildings, various Public Health Acts vest local authorities with power to make by-laws with respect to all buildings. The Public Health Act of 1875 enacts that every urb. and rural authority may make by-laws with respect to the structure of walls, foundations, roofs, and chimneys of new buildings for securing stability and the prevention of fires, and for purposes of health; also, with respect to the drainage of buildings and to the sufficiency of the space about buildings, so as to ensure a free circulation of air and proper ventilation. The Act also enables the local authority to frame by-laws with respect to existing buildings. Where an owner contemplates building operations he is required by the by-laws of most if not all local authorities to deposit plans of his intended buildings for the approval of the local authority, under pain of having his work pulled down, if he commences to build before the local authority signifies its approval and the building is not in

conformity with the by-laws. Approval or disapproval must be signified by the local authority within 1 month of the deposit of the plans. Consult *Ministry of Housing and Local Government, Model Bye-laws, Series iv, Building, 1953*.

Building Certificates are given at certain stages of building operations, by an architect to a builder or contractor, who, in his turn, presents them to the employer for payment. Interim certificates are those authorising payments on account during the progress of the contract, generally up to 80 per cent of the value of the work done. On completion of the contract a certificate is usually given up to 90 per cent of the value, leaving 10 per cent outstanding as retention money. At the end of the maintenance period a final certificate is given.

Building Lease, lease granted usually for a long term of years to a builder for the purpose of erecting, improving, adding to, or repairing buildings. The term does not include leases granted on the terms of merely keeping existing buildings in repair. A B. L. may be granted prior to the commencement of the building operations, but the general practice on the part of owners of land who are developing an estate is to enter into an agreement with the builder by which the latter covenants (see COVENANT) to build and the owner covenants to grant leases at a ground rent as and when the buildings are completed on any specified part of the land. The absence in a B. L. of a covenant to build is fatal to its validity. A mortgagor while in possession has power in the absence of a stipulation to the contrary to grant B. L.s for a term not exceeding 99 years. So, too, a mortgagee if in possession; if not, then only by virtue of an express power to grant leases. A tenant for life under the Settled Land Acts may grant B. L.s of the settled land for 99 years, so as to bind his successors; and may insert therein an option to purchase the freehold.

Building Society. B.S.s perform 2 distinct but mutually dependent functions. Firstly, they accept money from the public, pay interest on it, permit easy withdrawals, and generally provide a popular and convenient investment service. Secondly, they lend money on the security of freehold and leasehold properties by way of mortgage.

The earliest B. S. of which any record exists was founded in Birmingham c. 1775. Members of these early societies consisted of a small group of people with the common desire to own a house of their own. Each member agreed to pay to the society a fixed monthly sum and the accumulating funds were used to purchase the land and gradually to construct the houses. When every member had moved into his house the society was dissolved. During the 19th cent. these 'terminating' societies were gradually replaced by 'permanent' societies which borrowed from people who had money to invest but who did not themselves want to buy a house. The development of the permanent society and the granting of the right of incorporation in 1874 led to a great expansion of

activity, and by 1919 the total assets of all societies had reached the sum of £77 million. During the years between the 2 world wars B. S.s helped over 2 million people to become the owners of their own houses and by 1939 their total assets had increased tenfold to £773 million. Since 1945 there has been another rapid expansion, and at the end of 1956 total assets stood at £2,234 million, although allowance must be made for the decrease in the value of money since 1939.

B. S.s were first certified under the Friendly Societies Acts of 1829 and 1834, and in 1836 the first Building Societies Act was passed. This extended the friendly society regulations to B. S.s (in so far as they were applicable) and bound all members of a society by its rules. The society's property was vested in trustees. The Building Societies Act of 1874 is the basis of present practice and under its provisions the societies became corporate bodies possessing full legal powers corresponding to those of a limited company. Subsequent B. S.s Acts were passed in 1875, 1877, 1884, 1894, and 1939, but only the last two are of major significance. A gov. official known as the Registrar of B. S.s supervises the formation and conduct of societies under powers derived from the B. S.s Acts. The movement is nationally represented by the B. S.s Association which, at the end of 1956, had 350 members with combined assets representing 82 per cent of the assets of all societies in Great Britain.

There are 2 classes of investors in B. S.s, known respectively as shareholders and depositors, the former being much the more numerous. Most societies issue 2 different kinds of share, which are generally called paid-up shares and subscription shares. Paid-up shares are usually issued in fixed multiples of £5 or more and the liability of the shareholder is limited to the total amount invested. A subscription shareholder undertakes to pay a fixed monthly sum for an agreed period, at the end of which he becomes a fully-paid shareholder. Those subscription schemes have been designed to encourage regular saving. Shareholders are members of the society and have the right to vote at all general meetings. Should the society be wound up, its net assets would be divided amongst them according to their holdings.

B. S. shares can be withdrawn in cash by the investor on giving notice to the society and prompt withdrawal facilities are normally available. It will be apparent that shares in a B. S. are quite different from shares in a limited company and they are not dealt in on the Stock Exchange. In contrast to shareholders, depositors are not members of the society and they rank as prior creditors if the society should be wound up. For this reason, they receive a lower rate of interest. For the use of their money shareholders and depositors receive interest which is paid every half-year or year. The rate of interest is normally fixed by the directors and may be varied from time to time according to changes in

By special arrangement with the Board of Inland Revenue, the income tax (but not surtax) due on interest received from a B. S. is paid by the society. At the end of 1956, 3,240,095 shareholders and 571,301 depositors had invested £1,913,271,000 and £193,965,000 respectively in B. S. The money contributed by shareholders and depositors can be lent only on the security of a first mortgage of freehold or leasehold property and, in practice, B. S.s lend their funds mainly on the security of private dwelling houses purchased for owner-occupation.

When the directors of a society receive an application for an advance they have 2 main forms of security to consider: that offered by the property and that offered by the financial standing of the applicant. The Building Societies Act, 1939, laid down various classes of additional security which could be provided by, or on behalf of, a borrower for the purpose of supplementing the security offered by the property, e.g. a guarantee given by a local authority under the provisions of the Housing Act, 1940. If the advance offered by the society is acceptable to the potential borrower the society's solicitor investigates the title to the property and prepares the mortgage, after which a date is fixed for completion of the transaction. Although the borrower becomes the owner of the house, the deeds are retained by the society until the mortgage has been repaid.

Nearly all B. S. mortgages provide that the amount of the loan is to be repaid by monthly instalments over a period which may vary between 5 and 25 years. The most usual form of repayment is by means of a fixed monthly sum, part of which represents interest on the outstanding advance and part an instalment towards the repayment of the loan. As the loan is paid off the proportion of interest decreases and the instalment of principal increases correspondingly. If desired, mortgages can be combined with schemes of endowment and life assurance so that in the event of the mortgagor's death the deeds can be handed over to his dependants clear of debt. The rate of interest charged on a mortgage is dependent upon a number of factors, which include the general level of interest rates, the rates paid to investing members, the rate of income tax, and the level of management expenses. The borrower pays interest to the society gross but obtains an allowance in respect of the interest paid against his liability to pay income tax. At the end of 1956 there were 2,057,873 mortgages outstanding with B. S.s representing a total of £1,881,664,000 due from borrowers.

The B. S. idea has spread, particularly in Commonwealth countries, and since 1831 there have been similar organisations in the U.S.A. known as Savings and Loan Associations. The future development of B. S.s, like that of any other institution in the national life, is difficult to predict, but it is anticipated that by adapting their traditional objects to the needs of the time they will be assured of a steady growth and prosperity.

Building Stone. The use of stone quarried from the earth for building dwellings and monuments dates from very early times. Stone for building needs to be strong enough to support heavy loads, and capable of being worked by the mason's tools or by machine. It needs also to be resistant to weathering, especially if it is to be used in large tns where the rain-water is relatively acid. (Granites, sandstones, and limestones are most commonly used for building; granite is the strongest and most durable, limestone is the lightest in colour and the easiest to clean.

Granites occur mostly in great masses, which may cover hundreds of sq. m. of country. In England the granites of Cornwall are the most important, but the Leic. granite (Mountsorrel) and the Shap granite are also widely used. In Aberdeen granite is the prin. B. S., and much polished and cut granite is exported for ornamental work. Abroad, much granite is quarried in N. America, Canada, Norway, Sweden, and Russia.

Sandstone, perhaps the most widely used of B. S.s, consists of grains of sand cemented together by silica or by calcium carbonate, and ranging in colour from almost white to red, according to the amount of iron present.

Limestones consist chiefly of calcium carbonate. They weather gradually, so that surfaces washed by rain are self-cleaning; it is on sheltered surfaces that dirt tends to collect. Bath stone and Portland stone are widely used, the latter having furnished the material for St Paul's Cathedral. Magnesian limestone, or dolomite, occurs in varying qualities, and much of it affords good building material. The siliceous dolomite of Mansfield has been used in many important buildings. Crystalline limestone, or marble, is used chiefly for statuary and interior embellishment, the most famous kind being produced at Carrara in Italy.

Cast stone is a superior kind of concrete (q.v.) incorporating crushed natural stone as an aggregate.

The durability of B. S. depends on careful selection at the quarry and good practice in building, particularly as regards choice of mortar, provision of damp-proof courses, and design of details to shed water. Inappropriate methods of cleaning or restoration may hasten decay. See R. J. Schaffer, *The Weathering of Natural Building Stones*, 1932, and E. G. Warland, *Constructional Masonry*, 1946. See also MASONRY.

Bulth Wells, nrh. dist., par. and tn of Breconshire, Wales, a noted salmon-fishing centre. The tn was largely rebuilt in the 18th cent. after a disastrous fire. Pop. 1777.

Bulrette, Pierre Laurent, see BELLOY, DORMANT DE.

Butenzorg, see BOGOR.

Bujalance, Sp. tn in the prov. of Córdoba, with manufs. of textiles and leather. Pop. 11,500.

Bujnurd, see BOJNURD.

Buk'a's, El, see COBLE-SYRIA.

Buke, see SAMURAI.

Bukhara, or **Bokhara**: 1. Formerly a khanate of Central Asia. From 1865 to 1921 it was ruled by emirs, nominally independent, but under Russian control. In the latter year a Soviet revolution broke out and the emir fled to Afghanistan and in the following year Enver Pasha, as Commander-in-Chief for the emir, led an anti-Soviet rising, but was defeated and killed. It is now: 1. an oblast (prov.) of the Uzbek S.S.R. of the Soviet Union. It includes the lower Zeravshan valley and a large section of the Kyzyl-Kum desert. Cotton, silk, and fruit are cultivated. Pop. 480,000.

2. A tn consisting of 2 separate cities, the old and the new. The old city was the cap. of the khanate, and in its prime was a centre of Islamic culture. It is surrounded by trees and gardens, and is composed of one-storied brick houses with numerous mosques. It is (or was) a very important market for the products of Russia, Persia, India, and China, with its own industries of silk, cotton, leather, and cutlery. One section of the 7-m.-long bazaar was set apart for literature. There is a citadel containing the emir's palace and the water supply; and the city wall has 11 gates. The inhab. are Uzbeks, Turkomans, Afghans, Arabs, Hindus, and Jews. Pop. 60,000. New B., now known as Kagan, is 6 m. from the old city. It has railway workshops and a cotton processing industry. Pop. 30,000.

Bukharest, see **BUCHAREST**.

Bukharin, **Nikolai Ivanovich** (1888-1938). Russian politician, prominent theorist of the Bolshevik party, called by Lenin 'the darling of the Party.' He was the leader of 2 major oppositions, the Left Communists (q.v.) against Lenin in 1918 and the Right Opposition (q.v.) against Stalin 1928-9. He was executed after figuring as the main defendant in a show trial during the Great Purge. See his *The A.B.C. of Communism*, 1922; I. Deutscher, *Stalin*, 1949; L. B. Schapiro, *The Origin of the Communist Autocracy*, 1955.

Bükk Hills, see **MISKOLC**.

Bukovina ('Beech-tree country,' Ukrainian *Bukovyna*, Rumanian *Bucovina*, Ger. *Buchenland*), historical name, known since 1392, of an area in E. Europe, in the Carpathian foothills and the upper reaches of the Dniester, Prut, and Seret Rs. B. belonged to Roman Dacia, was laid waste by the Huns, and colonised by E. Slavs from the 6th cent. and by Rumanians from the 12th cent.; it was the core of the Moldavian principality formed in the 14th cent., which in 1512 fell under Turkish suzerainty. It was ceded to Austria in 1775, granted autonomy in 1861, and occupied by the Rumanians in 1918. The St Germain peace treaty of 1919 adjudged S. B. to Rumania, the Sévres treaty of 1920 the whole of B. As a result of a Soviet ultimatum N. B. (with a Ukrainian majority) was ceded to the U.S.S.R. in 1940 (see **CHERNOVETSY**, 1). 1941-4 N. B. again belonged to Rumania, but was finally ceded to the U.S.S.R. in the 1947 peace treaty. S. B. forms the *Suceava* and *Botosani* dists. of Rumania.

Bulacan: 1. Prov. of Luzon, Philippine Is. A hilly dist., containing spurs of the Caraballo Mts, and watered by the Pampanga R. The soil is fertile and there is considerable mineral wealth. Area, 1021 sq. m.; pop. 341,200.

2. Tn in above prov. on the Pampanga delta, 15 m. from Manila. Pop. 13,242.

Bulair, **Isthmus**, neck of land connecting the Gallipoli Peninsula, with Turkey at its N. end. When the Anglo-Fr. army landed on the S. portion of the peninsula in April 1915, the Turkish reserves were situated at B. A landing here was contemplated, but not attempted.

Bulak, the port of Cairo, situated on the Nile; it is connected with Cairo by an electric tramway and forms a NW. suburb of the city and industrial quarter. Pop. (1947) 232,602.

Bularchus, Lydian, is mentioned by Pliny as the painter of a large picture representing the capture of Magnesia (716 bc). It is said that Candaules, King of Lydia, purchased this painting for its weight in gold.

Bulawayo, cap. of Matabeleland and commercial cap. of S. Rhodesia. It stands on a table-land between the Limpopo and Zambezi Rs., 676 m. by railway W. of Beira, the nearest port. Gold is mined in the neighbourhood and coal also is to be found. B. is the most important railway centre in S. Rhodesia, and the H.Q. of the Rhodesian and the Beira and Mashonaland railways. It is surrounded by a wide expanse of excellent grazing country. From these facts the importance of the tn may be gauged. Its site was selected in 1893, and is 3 m. N. of the old royal kraal of Lobengula, which was the H.Q. of the Matabeles. To this fact B. owes its name, which means 'the place of the killing.' The *indaba* or judgment tree has been left standing. During the Matabele wars of 1896, B. was successfully defended, and the tn now contains a monument in memory of the pioneers killed on that occasion. Like most of the S. African tns, B. is built on the rectangular system around a market square, the thoroughfares running from N. to S. being streets, those running from E. to W. being avenues. Among the prin. buildings are the gov. house, once the property of Cecil Rhodes, the municipal buildings, market house, court house, memorial hospital, library, and museum. The last, which was opened in 1910, contains objects found at Zimbabwe and other ant. ruins in Rhodesia. Some of the golden objects found in the Zimbabwe Ruins were stolen from the museum. There are sev. fine hotels and modern buildings. The Matjesumshlope R. runs along the E. side of the tn, and its valley has been converted into 2 parks; in N. Park is a zoological garden. The Rhodes estate, now a gov. experimental farm, 115,000 ac. in extent, lies 5½ m. from B. In the neighbourhood are the Matopo Hills, where Rhodes and Jameson were buried. A huge bronze statue of Rhodes by the late John Tweed stands in Main Street. Bushman paintings are to be found in the vicinity, and

14 m. to the W. of the tn lie the Khamsi ruins of unknown antiquity. Pop. (including suburbs) 1955, 133,400 (40,000 Europeans.)

Bulb, in botany, a modified underground shoot consisting of a short, thickened, disk-like stem, or plate, surrounded by a number of overlapping leaves which contain reserve material for the next season's plant. Adventitious roots grow at its base, and usually small buds arise in the axils of the innermost leaves. The B.s of the onion and hyacinth are said to be *tunicated*, i.e. the leaves completely envelop the modified shoot like a tunic; the B. of the lily is *scaly*, or *imbricated*, i.e. the leaves merely overlap one another. The crocus B. is in reality a *corm*, or solid fleshy stem bearing membranous leaves.

Bulbul, Arabian and Persian name for a species of nightingale (probably *Luscinia hafizi*) introduced by Moore and Byron into Eng. poetry.

Bulford, vil. of Wilts, England, on the Avon, 2½ m. to the NE. of Amesbury. Has a large military camp. Pop. 992.

Bulgakov, Sergei Nikolayevich (1871-1944), Russian philosopher, economist, and theologian. He started as a Legal Marxist (q.v.), but later became an Idealist and an Orthodox priest; he was a Constitutional Democrat member of the State Duma. B. was expelled from the Soviet Russia in 1922, and lived in Paris as a professor at the Russian Theological Institute. His works in English are *Social Teaching in Modern Russian Orthodox Theology*, 1934, *The Orthodox Church*, 1935, and *The Wisdom of God*, 1937.

Bulganin, Nikolay Aleksandrovich (1895-), Russian Communist. He joined the Bolshevik party in 1917, and worked in leading positions in the Cheka (q.v.), 1918-22, and in the Supreme Council of National Economy, 1922-7. He was manager of the Moscow Electroworks, 1927-31, chairman of the Moscow City Council, 1931-7, chairman of the Council of People's Commissars (Prime Minister) of the Russian Federated Rep., 1937-8, and chairman of the Board of the U.S.S.R. State Bank and deputy chairman of the U.S.S.R. Council of People's Commissars, 1938-41. During the Second World War B. was a 'member of the military council' (i.e. political commissar) of the Western front, 1941-3, working for a time with Zhukov (q.v.) when the latter was commanding the front; he was also a member of the State Defence Committee (q.v.) and deputy People's Commissar for Defence from 1944. He was Defence Minister, 1947-9, and again, 1953-5, and simultaneously deputy Prime Minister, 1947-55. He has been a member of the Central Committee of the Communist party since 1934, and a member of its Politburo (q.v.) since 1948; at the end of the war he was made a marshal. After Stalin's death B. was at first a secondary figure in the new collective leadership, but after Malenkov's (q.v.) resignation in 1955 he became Prime Minister and formed with Khrushchev (q.v.) a kind of diumvirate in which he plays the second role.

Bulgar, or **Great Bulgar**, cap. of Volga Bulgarians (q.v.) and economic centre of the Volga region in 10th-15th cents., with international fairs. It was destroyed by Muscovite troops in 1431. Its ruins are at Bolgary, vil. in the Tartar Rep., 60 m. S. of Kazan.

Bulgaria (*Narodna Republika Bulgaria*), rep. in E. Europe, in the Balkan Peninsula (q.v.), bounded N. by Rumania, E. by the Black Sea, S. by Greece and Turkey, and W. by Yugoslavia (qq.v.). Area 42,796 sq. m.

Geography. The R. Danube (q.v.) forms the N. boundary of the state, except in the NE. dists. Between the riv. and the Balkan Mts (q.v.) lie the Bulgarian lowlands, the average width of which is about 60 m. S. of the Balkan Mts is E. Rumelia (q.v.), which is crossed W.-E. by the fertile valley of the Maritza (q.v.) and its tribs. On the S. boundary stretch the Rhodope Mts (q.v.). The climate of the country is of the continental type, with hot, dry summers and cold winters; there is much rain in spring and autumn. The uplands experience extremes of temp. Forests, composed mainly of oak, beech, larch, spruce, fir, and pine, cover 7,593,875 ac., of which the greater part is economically useful. There are orchards of plums, walnuts, apples, pears, and cherries. Bear, wild boar, red and roe deer, chamois, wolves, squirrels, eagles, and wild-fowl are plentiful.

Constitution. The Bulgarian People's Rep. was proclaimed by the National Assembly on 15 Sept. 1946. The constitution of 4 Dec. 1947 provides for a National Assembly of 1 chamber only, in which is vested supreme authority. The deputies of the National Assembly are elected by universal suffrage, all citizens over the age of 18 being eligible to vote and to hold office. The National Assembly elects the Presidium, the highest organ of the state, which consists of a chairman, 2 deputy chairmen, 15 members, and a secretary.

Local administration and justice. In 1949 B. was divided into 14 provs. (*okrag*), 2 of which were subsequently abolished. The names of the present 12 provs. are as follows: Blagoyevgrad, Burgas, Khaskovo, Kolarovgrad, Pleven, Plovdiv, Ruse, Sofia, Stalin, Stara Zagora, Tyrnovo, and Vratsa (qq.v.). These provs. are subdivided into 95 dists. (*okolya*). The constitution provides for the election of members of the Supreme Court by the National Assembly; other judges are elected by the people. The lower courts have lay assessors as well as jurists. Prosecutors in the courts are appointed by the Procurator General, the chief official of the legal system, who is elected for a period of 5 years by the National Assembly. The code of criminal procedure (introduced in 1952) is based on Soviet law.

Population, religion, education, chief towns. The pop. in 1953 was 7,450,000. National minorities, totalling over 1,000,000, include Turks, Macedonians, Armenians, and Jews. Some 6,000,000 of the inhab. belong to the E. Orthodox

Church (disestablished in 1949). In 1953 the Bulgarian Patriarchate was revived, and the first Patriarch since 1393 was elected. In 1949 there were 638,000 Turkish Muslims; 123,000 Bulgarian Muslims (known as *Pomaks*); 56,000 Rom. Catholics; 23,000 Armeno-Greeks; 20,000 Jews; and 15,744 Protestants. The relations of churches in B. with churches or missions abroad are under the supervision of the Ministry of Foreign Affairs. No church may maintain schools or colleges (except theological colleges). Elementary education in the state is free and obligatory for children between the ages of 7 and 15, and the educational system is organised on Soviet lines. There are about 6800 schools (excluding 1071 Turkish and 16 Armenian schools), and there are 2 univs. (at Sofia and Plovdiv). The Academy of Sciences has 32 institutes. The prin. tns are Sofia (the cap.), Plovdiv, Stalin, Ruse, Burgas, Pleven, Stara Zagora, Sliven, Kolarovgrad, Yambol, Tolbukhin, and Dimitrograd (qq.v.).

Language and literature. The original Bulgarian tongue was Ural-Altai, but it has left only a few traces in the Slavonic speech adopted by Bulgars who settled in the Balkan Peninsula. The Bulgarian-Slavonic tongue is closely allied to the Russian, but some Serbian, Gk, Romanic, Albanian, and Turkish elements have found their way into the language. Peculiarities include a considerable loss of nominal inflections and a suffixed article. The earliest Bulgarian literature came to an end with the completion of the Turkish conquest, 1396. From then on B. produced no written literature until 1762, from which date the start of the Bulgarian renaissance may be dated, when Paisy (q.v.) of Khilendar compiled the *Slaveno-Bulgarian History* in a spirit of patriotic exhortation. Only after the need for educational books in modern Bulgarian had been satisfied did imaginative literature begin to appear. The first writers of importance are Lyuben Karavelov (1837-79), the short-story writer; Petko Slaveykov (1827-95), the poet; and Khristo Botev (1846-76), the poet (qq.v.), killed in an abortive rising against the Turks. The outstanding figure of Bulgarian literature, and the greatest shaper of the literary language, is Ivan Vazov (q.v.) (1850-1921), novelist, poet, and dramatist, most of whose work appeared after the liberation. His near contemporaries were Pencho Slaveykov (q.v.) (1866-1912), poet and son of the poet Petko Slaveykov; Stoyan Mikhailovskiy (q.v.) (1863-97), satirical story writers; Petko Todorov (1879-1916), dramatist; and P. K. Yavorov (1879-1914), dramatist and poet. Dimcho Debelyanov (1887-1916), a sensitive poet, was killed in the First World War. A few of the many others that might be mentioned are Elin Pelin (1878-1949) and Yordan Yovkov (1884-1937), short-story writers, and Nikola Raynov (1889-) and Elisaveta Bagryana (1893-), poets. From 1944 Bulgarian literature took the direction usual in countries satellite to the U.S.S.R.

Agriculture. Of the total acreage of 25,488,343, 12,058,480 ac. are cultivated. Since 1945 no one may own more than 49.4 ac. Historically the country has been one of small peasant proprietors, but in 1953 there were 2747 co-operative farms (comprising nearly 569,000 household units) and 100 state farms. The chief products are wheat, rye, barley, oats, maize, potatoes, fruit, vines, cotton, tobacco, and sugar-beet. Silk is also produced. The following livestock targets were laid down for 1957: 9,700,000 sheep and goats; 2,200,000 pigs; 2,090,000 cattle; and 8,000,000 poultry.

Industry and commerce. On 23 Dec. 1947 private industry was nationalised: the property of private firms was transferred to the State, together with business profits in the owners' private accounts. State economic planning was begun with a Two-year Plan, and there have since been 2 Five-year Plans (1949-53; 1953-1957). Seven new power stations have been built since 1950, textile mills have been built at Plovdiv and Sliven, and a chemical plant has been built at Dimitrograd. The coal resources of the country consist mainly of young lignite, and some copper, tin, zinc, and lead are found. Sixty per cent of imports come from the U.S.S.R., to which country goes 52 per cent of exports. Exports to W. Europe in 1954 were valued at 27 million dollars (U.S.A.), and imports from W. Europe at 18 million dollars.

Communications. There are about 14,000 m. of roads and 2800 m. of railway (state-owned). Sofia is linked by air with Moscow, Budapest, and Prague. The Bulgarian airline T.A.B.S.O., has airports at Sofia, Plovdiv, Burgas, Stalin, Stara Zagora, Gorna Oryahovitsa, and Tynovo. In 1956 the country had 9 ocean-going ships, in addition to a number of riv. steamers.

Defence. The strength of the Bulgarian Army in 1955 was estimated as 175,000 men. There are 3 army regions: Sofia, Plovdiv, and Stalin. The number of security police is estimated as 80,000. The air force is organised in fighter, escort, and tactical bombing divs.

Currency, etc. The unit of currency is the *lev* (plural *leva*). The parity is: 1 rouble (Russian) equals 1.70 *leva*. The metric system (q.v.) is in general use.

Historical. B. was originally inhabited by Thracians, and under the Romans formed the prov. of Moesia. Later it was occupied by Slavonic tribes. The Bulgars were originally a Ural-Altai people. They came traditionally from the banks of the Volga and crossed the Danube in the 6th cent., and occupied the E. They overcame the Slavs, adopted their language and customs, and soon became a great Slav power. In 870 Boris, their chief, adopted Orthodox Christianity, and the Bulgarians became dependent on the patriarchate of Constantinople. The Bulgarians were victorious against the Magyars and Greeks in the 9th and 10th cents. Simeon, their prince, assumed the title of 'Autocrat of all the Bulgarians and of all the Greeks,' and Serbs and

Byzantines paid tribute to him. The Bulgars dominated Macedonia, Thessaly, Epirus, and Albania. Towards the end of the 10th cent., however, their power began to decline. At the end of the 10th cent. part of E. B. was incorporated with the Bulgarian Empire, and in 1018 the W. Bulgarian kingdom became a Byzantine prov. In 1186 a third Bulgarian kingdom was formed in the N. by a successful rebellion, and remained in existence until 1396, when it was conquered by the Turks. Under the influence of Byzantium and of Christianity, B. had attained in the Middle

Bulgarian prov., S. of them, known as E. Rumelia, it granted administrative autonomy. In 1885 E. Rumelia was incorporated with the Bulgarian state. Taking advantage of the Young Turk revolution, 1908, and Austria's annexation of Bosnia-Herzegovina, Ferdinand, the Bulgar ruler, repudiated the last shreds of Turkish suzerainty. This action was allowed to stand by the great powers. In 1912 B., with Serbia, Greece, and Montenegro, formed the Balkan League, and with its allies formulated the demands which led to the Balkan first war between



E.N.A.I.

THE VALLEY OF THE ISKER, NEAR KARLUKOVO, BULGARIA

Agos a degree of civilisation equal to that of W. nations, but this was largely destroyed by the invasions of Tartars and Osmanli. For close upon 500 years the Bulgars were subject to the rule of the Ottoman Empire, and many of them adopted Mohammedanism. In 1876 the Turks and the Mohammedan Bulgars (known as Pomaks) massacred sev. thousand Christian Bulgars as a reprisal measure after rebellions in other parts of Turkey's Christian ters. These 'Bulgarian atrocities' awakened horror throughout Europe, and especially in England, and suggestions were made for forming 2 autonomous states. The Porte refused to make concessions, and in 1877 Russia, as guardian of the Slav races of Turkey, declared war. As a result of the war, the Berlin treaty (1878) constituted an autonomous though tributary B., N. of the Balkans, whilst to the mainly

the League and Turkey. To B.'s lot fell the heaviest fighting, and to her troops and generals the success of the war was largely due. Subsequently the second Balkan war robbed B. of most of what she had gained in the previous year's fighting, and resulted in her isolation from her other Balkan neighbours (*see BALKAN WARS*).

Bulgaria and the First World War. B. entered the war in Oct. 1915, and almost exactly 3 years later surrendered unconditionally to the Entente forces. The hist. of this ill-starred country, after it became a sovereign independent state, was one of victimisation to dynastic ambitions. After the abdication of Prince Alexander of Battenberg (elected ruler in 1879) the throne was offered to the wealthy and ambitious Prince Ferdinand of Saxe-Coburg (1887). In 1908 Ferdinand proclaimed himself King of B. and,

3 years later, changed his title to tsar. Many of B.'s misfortunes may be attributed to the overmastering aspirations to power of this monarch, who, after the fiasco of the Balkan wars of 1912-13, sought to retrieve his country's ruin by intrigues with Germany, the outcome of which was the loss of his crown and, to the country, not only of everything it had won in the Balkan wars, but of its prosperity for years to come.

It was obvious at the very outset of the First World War that B., standing in the highway of Ger. aspirations S.E. to Bagdad, would sooner or later be involved. What was not obvious, at least to the Entente diplomats, was that the Bulgarian king and his Cabinet had definitely decided, long before the Bulgarian armies crossed the Serbian border late in 1915, to throw in their lot with the Central Empires. Ferdinand's prin. object was dynastic aggrandisement. He had visions of the sure triumph of the Central Empires, with Germany's trade and prosperity reaching out overland towards India and his own kingdom, enlarged beyond recognition, a member of the new Kaiserbund of *Mittleuropa* and the natural corridor between the new Germany and Asia Minor, and the custodian of the great Ger. railway from Berlin to Bagdad. But as regards the Bulgarian people at large, ill-educated peasantry for the most part, it may be assumed that the one thing, if any, that stimulated their war ardour was their dislike of their Serbian and Gk neighbours. The Allies made unsuccessful attempts to win B. over to their side early in the war. The mobilisation of the Bulgarian Army in the early autumn of 1915 in the alleged interests of 'friendly neutrality,' coupled with the presence in this army of large numbers of Ger. officers, caused the Russian Gov. on 3 Oct., in concert with the other Entente powers, to send an ultimatum to B. This led to war within 3 days. On 7 Oct. Austro-Ger. troops invaded Serbia, and 4 days later the Bulgarian armies, under the direction of Ger. officers, crossed the Serbian frontier from the E. Shortly afterwards a secret Germano-Bulgarian treaty was revealed, by which B., as the price of her aid in siding with the Central Empires, was promised Albania, together with Gk and Serbian Macedonia. On 15 Oct. 1915 Great Britain sent a note to the Bulgarian Gov. to the effect that a state of war existed between the 2 countries. On 22 Oct. the Bulgarians captured Uskub (Skopje). The Serbian Army fled before the combined Austro-Ger.-Bulgar drive into Albania with the loss of its artillery and transport. Thereafter all was quiescent for many months, the Allies, operating from Salonika, hesitating to move forward for fear of treachery on the part of Constantine, King of Greece. It was not till late in Aug. 1916 that the campaign was renewed, when the Bulgarians moved on Kavalla. In Sept. 1918 the Balkan front once again blazed into activity, and in a few weeks the Bulgarian Army, defeated and outclassed, was in headlong retreat. On 30 Sept.

1918 the Bulgarian envoys came to Salonika and signed an armistice with Franchet d'Esperey, Commander-in-Chief of the army of the Orient. The most important effects of this unconditional surrender were that the direct Ger. route to Constantinople fell under allied control; the Lower Danube ceased to be available for enemy traffic, while Germany and Austria-Hungary found themselves unable to reinforce or supply Turkey except through Black Sea ports.

By the treaty of Neuilly, 1919, B. ceded to Greece her Thracian ters., thus losing her access to the Aegean Sea; though an economic outlet to it was provided by the treaty, the exact terms remain a subject of dispute. To Rumania B. lost S. Dobruja, her richest wheat-growing land, and she also lost a strip of ter. to Yugoslavia. Ferdinand had meanwhile abdicated in favour of his son, Boris. Sev. years of internal instability followed. In 1934 a military *coup d'état* overthrew the gov. of Agrarians and Democrats, and the king was forced to agree to the formation of what was in effect a semi-military dictatorship to offset the political and moral deterioration of his country. The new gov. turned upon the Macedonians, whom the army soon reduced to obedience or expelled. The gov. was so hostile to Boris that he was in danger of deposition, but his diplomacy and popularity with the peasantry, in conjunction with the dissensions in the army, saved his throne, and ultimately the militarist combination fell to pieces and the king was from 1935 virtual dictator of the country. In 1938 the king won a diplomatic success by securing the release of B. from the punitive clauses of the treaty of Neuilly; but by that time European peace was threatened, and the outbreak of war found B. with next to no market for its produce save Germany; the army was entirely dependent on Ger. weapons, Ger. intrigue was rife, and the general staff was largely pro-German. Though the army was not used against Russia and diplomatic relations were retained with the U.S.S.R., B. joined in the signing of the second anti-Comintern Pact; Bulgarian troops and Macedonian bandits oppressed Greeks and Yugoslavs, and war was declared on Great Britain and the U.S.A. Ger. troops entered the country in Mar. 1941 and occupied Black Sea ports, though B. was not officially at war with Russia. In 1943 the king *d.* mysteriously, and was succeeded by his infant son, Simeon. On 26 Aug. 1944 the gov. declared B. to be neutral in the Russo-Ger. war, and Bulgarian delegates to Cairo tried to secure eleventh-hour terms of peace from Great Britain and the U.S.A. Russia, however, refused to recognise the so-called neutrality of B. and called upon B. to declare war against Germany, and when no satisfactory reply was received by 5 Sept., Russia declared war on B. B. could only sue for an armistice, and on 7 Sept. its gov. declared war on Germany. Hostilities with Russia ceased a few days later. An armistice with the U.N. was signed in Moscow on 28 Oct. Russian

troops were now occupying B. and their influence on the political events which followed is obvious.

Sept. 9, 1946, second anniversary of the Bulgarian revolution, by which the Fatherland Front had seized power, was marked by the proclamation of a People's Rep. after the Soviet model for which the plebiscite of the previous day had given a large majority. The young King Simeon was forced to abdicate. The Fatherland Front had been formed during the war by the Communist, Agrarian, Socialist, and Zveno (professional and army class) parties. It provided the political leadership of the Partisan movement, and had finally brought the Bulgarian Army into the war on the allied side. By late 1946 Communist control in B. was virtually complete. A general election was held on 27 Oct. 1946. The Fatherland Front obtained 364 seats (277 of which went to the Communists) and the opposition 101. In Aug. 1947 the opposition Agrarian Union was dissolved and its leader, Petkov, was hanged on 23 Sept. on a charge of treason. The peace treaty was signed in Paris on 10 Feb. 1947.

Since the end of the Second World War B. has proved a generally subservient satellite of the U.S.S.R. The elections of Dec. 1949 gave the Fatherland Front over 97 per cent of the votes. Since then one-party gov. has been acknowledged in theory as well as in fact. In the same year B. had followed official Soviet policy with regard to Yugoslavia, and had abrogated her treaty of friendship with that country, signed in 1947. In 1950 Soviet citizens in B. were accorded special status, including the right to hold any public office.

Though intermittent changes in the leadership of Bulgarian affairs has suggested that B.'s stability as a Communist state may be more apparent than real, the rebellions against Soviet domination, shown at various times and in varying degrees in other Communist countries (e.g. Yugoslavia, Poland, and Hungary), have not had any pronounced effect in B., though in 1956-7 it was admitted, after the Hungarian rising, that disaffection existed among a section of the student pop. in Sofia. It should be remembered, however, that B. has had no real experience of democracy as it is practised in W. Europe; and that the existing regime has conferred substantial benefits on the peasant majority of the pop. in such spheres as economics and education, etc.

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Bulgarian Milk, milk containing lactic acid. Sour milk has long been looked upon as a healing agent, and the hastening of the souring process by introducing a portion in which the bacteria have already been at work is an idea borrowed from the Bulgarians and Tartars. The bacteria help in the formation of lactic acid, which acts as a preservative, preventing further decomposition. It is suggested that when sour milk is taken as food, the bacteria multiply in the intestines and aid digestion by preventing harmful fermentation.

Bulimia, Boulimia, or Bulimy, insatiable hunger (Gk *boulimia*, from *bous*, ox; *limos*, hunger).

Bulimus is the name of a large genus of land-snails comprising over 1000 species. They have external shells, and are related to the hedge- and grass-snails.

Bulkheads: 1. The partitions which divide up the internal spaces of a ship. They are generally transverse and water-tight, but they may be longitudinal and partially or completely non-water-tight, as the circumstances may require. In warships particularly the transverse water-tight B. are very numerous, to check the entrance of water through damage while in action, and, as a rule, each bulkhead is fitted with an hydraulically worked door which closes automatically when the compartment is flooded. The subdivisions required by Lloyd's Register for all steamers are 4, i.e. one bulkhead at each end of the machinery spaces and one at a reasonable distance from each end of the ship. For larger steamers other B. have to be fitted according to their size. The bulkhead nearest the bows is called the collision bulkhead and that nearest the stern the after-peak bulkhead. In sailing ships the collision bulkhead only is required.

2. The sea-walls which mark the line of the shore and from which the piers and quays project.

3. A general term for a partition in mines and tunnels, etc., sometimes solid and sometimes provided with a door for passage of men and materials.

Bulkley, Lucius Duncan (1845-1928), Amer. dermatologist, educ. at Yale and the Medical Dept of Columbia College, New York, where he qualified, 1869; later studied medicine in Europe. Took a leading part in the foundation of the New York Skin and Cancer Hospital, where he acted as consulting physician and later held similar positions in other New York hospitals. Pubs.: *Eczema and its Management*, 1881; *Manual of Diseases of the Skin*, 1898; *Compendium of Diseases of the Skin*, 1912; *Cancer, its Causes and Treatment*, 1915-17; *The Medical Treatment of Cancer*, 1919; *Cancer and its Non-surgical Treatment*, 1921; *Cancer of the Breast*, 1925.

Bull, George (1634-1710), learned Eng. churchman, educ. at Tiverton School and Exeter College; would not take the oath of allegiance to the Commonwealth, and was privately ordained, in 1655, by Bishop Skinner, who thereby committed a capital offence. As minister of St George's, near Bristol, he followed the

liturgy under the cloak of extemporary devotion. In 1658 he became rector of Suddington, near Cirencester; 1686, archdeacon of Mlandaff; 1705, Bishop of St David's. His *Harmonica Apostolica*, 1659, written in Latin, deals with the views of St Paul and St James on justification, but the work which estab. his high reputation was entitled *Defensio Fidei Nicenae*, 1685.

Bull, John (c. 1562-1628), Eng. organist, virginal player, and composer, b. perhaps in Somerset; he became organist of Hereford Cathedral in 1582, and in 1585 was admitted to the Chapel Royal. He was the first prof. of music at Gresham College, and one of the musicians of Prince Henry. He left England in 1613, settled in Brussels at first, but in 1617 he became cathedral organist at Antwerp, where he d. He is important as a brilliant composer of virginal pieces.

Bull, John, popular term for the typical Englishman. It took its rise from Arbuthnot's *History of John Bull*, 1712 (in which the Church of England figures as his mother), a political skit satirising the Duke of Marlborough, and stirring up public feeling against France. J. B. begins to figure frequently in broadsides and caricatures about the time of the Fr. Revolution. The idea has since evolved in *Punch* and other humorous papers.

Bull, Ole Borneman (1810-80), Norwegian violinist, b. Bergen, and largely self-taught. In 1828 he appeared at a concert, and was so successful that in 1829 he went to Cassel to study under Spohr. He soon returned to Bergen, but in 1832 made his true debut in Paris. Here he heard Paganini, and adopted his style of playing. He performed with great success all over the Continent till 1839, when he went into retirement for a few years. In 1843 he went to America, which he frequently revisited. His technique was brilliant and he showed to best advantage in the national fantasias of his own composition.

Bull, see Ox.

Bull, papal instrument, ordinance, letter, or decree, issued by the Apostolic Chancery, and differing from briefs down to 1878 in being written in Gothic script. At that date Pope Leo XIII ordered the use of Lat. script, and restricted the use of the very anct leaden seal to important B.s, replacing it in other cases by a red one. B.s are written on parchment, to which the seal is attached by a yellow or red silk cord when concerned with the granting of favours, but by a grey one when dealing with the administration of justice. The name comes from the Lat. *bulia* (see *BULLA*), a capsule of wax surrounding a seal; the term being extended to the seal itself, and then to the document. All B.s begin with the name of the pope, followed by *Servus servorum Dei*. Among the most famous B.s of hist. are *Clericis Laicos*, 1296, and *Unam Sanctam*, 1302, issued by Boniface VIII against Philip le Bel of France, both dealing with the taxation of church property (see under *CLERICIS LAICOS*); *In Cena Domini*,

1362, issued against heretics by Urban V; *Execrabilis*, 1460, in which Pius II declared the papal superiority over the councils; *Etsurge Domine*, 1520, issued by Leo X against Luther and burned by him; *Regnans in Excelsis*, 1570, in which Pius V excommunicated Elizabeth I of England; *Unigenitus*, 1713, which condemned Quesnel; *Dominus ac Redemptor Noster*, 1773, issued by Clement XIV to abolish the Jesuits; *Ecclesia Christi*, 1801, which estab. the Concordat with France; *Sollicitudo Omnium*, 1814, by which Pius VII restored the Jesuits; *Ineffabilis*, 1854, proclaiming the doctrine of the Immaculate Conception, *Pastor Aeternus*, 1870, in which Pius IX proclaimed papal infallibility, and *Munificentissimus Deus*, defining the Assumption of the Blessed Virgin as an article of faith, 1950.

Bull, amusing and unintentional blunder in speech, due to the conjunction of incompatible ideas, and implying an evident contradiction in terms. B.s are usually associated with Ireland, and many of the best examples are Irish. One of the most famous is that made by a speaker during the Parnell 'ommission, himself a soldier who had run away during action, who stated that it was 'better to be a coward for a few hours than to be dead all the rest of your life.' See R. L. Edgeworth, *Essay on Irish Bulls*, 1802.

Bull, The, see TAURUS.

Bull-baiting, formerly a popular sport in England. A bull, with the points of its horns protected, was fastened to a stake and attacked by bulldozers. The sport was abolished by law in 1835.

Bull-fight. Combats of men with bulls have for long been a favourite national sport with certain of the Lat. races. They appear to have been common in Greece and Rome, and still exist in Portugal, France, Mexico, and especially in Spain, where they were abolished by Charles IV, but reintroduced by Joseph Bonaparte. Up to the Sp. Civil War (1936-9) B.s were held in all the large towns of Spain, particularly in Madrid, either for personal profit or for charitable objects. But since the war the sport has waned. The bulls are bred in Castile and Andalusia, the former being preferred. The most famous fights were held in the Plaza de Toros at Madrid, a kind of open-air circus, surrounded by tiers of seats and boxes, and capable of accommodating 10,000 to 12,000 people. The typical B. begins with a processional entry of the combatants, in which the matadors lead, being followed by the banderilleros, the picadors, and lastly the *monos sabios*, or attendants with spare horses. After saluting the mayor, the picadors, dressed in a picturesque national costume, armed with lances, and mounted on worn-out horses, take up their position in the centre of the arena. A bull is then let out, and the picadors attack it with their lances. The horses are urged on by attendants with sticks, who are dressed in blue and red, and when a horse is either wounded or throws its rider, the banderilleros attract the attention of the bull by waving their red and yellow capes while

the picador makes his escape. The banderilleros save themselves by leaping over the barricades. After the picadors have fought for some time, they leave the ring and are succeeded by the banderilleros, who infuriate the bull by means of banderillas. These are gaily coloured and ornamented barbed darts, about 2 ft long, sometimes having fire-crackers attached to them which the men stick into the animal's neck. Finally a matador, bearing a naked sword and a *muleta*, or vermillion flag, enters and salutes the mayor. He lures the bull by means of the red cloth, and as it blindly rushes at him, steps aside and attempts to kill it by delivering the sword through the back of the neck and downward into the heart. This requires great skill and dexterity, the killing of the bull often involving repeated thrusts. As soon as the bull is dead the performance recommences with a fresh animal, and should the matador, as occasionally happens, be fatally gored by the bull, another matador takes his place. Eight or ten bulls are often killed in one day, and the slaughter of horses is very large and involves revolting cruelty. Successful matadors achieve immense popularity and are able to retire with large fortunes. The 2 most famous have been Rafael Guerra, or Guerrita, and Manuel Esparto. B.s. in the milder form of bull-baiting, have in recent years been introduced into S. France, but the worst abuses are avoided. See T. Lea, *The Brave Bulls*, 1950.

Bull Mastiff, see **MASTIFF**.

Bull Moose, name of a third party founded in 1912 by the friends of former president. Theodore Roosevelt, which gave occasion to one of the most famous presidential campaigns in the hist. of the U.S.A. In 1908, when the presidential term of Roosevelt was expiring, he brought about the nomination of W. H. Taft (q.v.) by the Republican convention. But shortly after Taft entered the White House a notable coolness sprang up between the 2 men, because Roosevelt thought Taft had gone back on progressive principles. When the Republican convention of 1912 met in Chicago, Roosevelt entered the lists against Taft for renomination, his friends putting him forward for a third term. But Taft and the old-line politicians had a firm grip on the convention. As soon as this became apparent, the Roosevelt followers left the convention and set up a 'rump' convention of their own. Roosevelt was promptly nominated for the presidency. One day while attending the Republican convention Roosevelt was asked how he felt. He replied, 'Like a bull moose.' The metaphor was at once seized upon by newspaper cartoonists and political orators, and the new party was promptly christened the 'Bull Moose' party. The nominees of the party were placed on the ballot under the emblem of the bull moose, just as in most states the Democratic candidates are listed under the rooster and the Republicans under the Amer. eagle. The net result of the Bull Moose ticket was to split the Republican party

completely. Woodrow Wilson won by the greatest majority known in modern times. Taft was likewise the most heavily defeated man. The Bull Moosers, as they were popularly known, had declared their intention of forming a permanent progressive third party, and expectation was keen as to what would happen in 1916. But the political genius of the Amer. people is against more than 2 major parties, and Roosevelt himself destroyed the chances of his new party when he declined to stand again.

Bull-roarer, Whizzer, Whizzing Stick, or **Lightning Stick**, instrument employed by savage people usually for the purpose of causing rain. It consists of a rectangular slat of wood from about 6 in. to 2 ft long, and $\frac{1}{2}$ in. to 2 in. wide, suspended by one end to a cord, the latter often being provided with a wooden handle. It is whirled rapidly about the head, and the noise of the air against the slat produces a roaring or whizzing sound. Among some Australian tribes it is thought to be employed for the purpose of frightening the women away from tribal councils or religious orgies, the females being told that it is the voice of the presiding god or demon. But in N. America it is, or was, used as an instrument of sympathetic magic, its noise being supposed to represent that of the wind which accompanies rain, and it is employed to induce by mimicry the actual wind itself.

Bull Run River, small riv. in Virginia, which has given its name to 2 battles fought in the neighbourhood during the Civil war: (1) 21 July 1861, when the N. troops, under McDowell, were utterly defeated by the Confederates under Beauregard. (2) 29-30 Aug. 1862, when the Union forces under Pope, who was attempting to guard the Potomac line, were crushed by the Confederate forces under Lee, reinforced by Jackson.

Bull-terrier, cross-breed of bulldog and terrier. The B. is a very strong, plucky dog, and a fearless fighter, with infinite determination. It is somewhat ferocious as a house-dog, but is gentle and affectionate to its owner. It has short, smooth hair, which should preferably be white in a good breed, but may be reddish, brown, or fawn. It weighs from 20 to 50 lb., but some toy varieties have been produced which weigh as little as 7 lb. The tail is left uncropped, and should be carried in a straight line with the back; the front legs firm and straight, and the jaw strong. White B.s. are permitted black markings on the nose, ear, and eye.

Bull Trout is a term applied to various species of *Salmo*, which are natives of N. Europe, and belong to the Salmonidae, or family of trout salmon, and char. The name is frequently applied to *S. erioz* and *S. cambricus*, also known as the grey trout. *S. trutta* possesses this name as well as those of sea trout, salmon trout, sewin, and pinok.

Bulla (Lat. 'bubble': hence an ornamental stud or boss), term used particularly of a heart-shaped case containing an amulet, and worn round the neck by free-born Rom. children. Boys ceased to

wear it on attaining manhood, girls on marriage. The custom, of Etruscan origin, became general after about 200 B.C. The term B. was later applied to the leaden seal attached to a papal document, which was thence called a Bull (q.v.).



BULL-TERRIER

Bulla, or **Bubble-shell**, is a genus of gastropod molluscs of the order Euthyneura. The species inhabit muddy and sandy sea-water and feed on animal matter. The shell is external, has no projecting spire, and is so thin that it resembles a bubble. *B. solitaria* is an Amer. species.

Bullace, or *Prunus insititia*, family Rosaceae, is nearly related to the sloe and plum. The fruit is globose, and the plant is a native of Britain.

Bullae, collections of serum raising the outer skin from the true skin. They may be due to injury or friction as in rowing, or be symptomatic of skin affections, as pemphigus and hydroa.

Bullant, Jean (c. 1515-78), Fr. architect and sculptor, b. Écouen, studied the classical monuments in Italy, as may be gathered from his treatise entitled *Regle générale d'architecture des cinq manières de colonnes*, 1568. For the Duc de Montmorency, who lived at Écouen, he made additions to the château there, designed the Châtelet at Chantilly, and sundry other work. As royal architect, he added a pavilion to the Tuileries palace in Paris, 1570-2. He may also have designed the chapel at Anet; and the Musée Carnavalet in Paris, in partnership with P. Lescot (q.v.).

Bullard, Robert Lee (1861-1947), distinguished Amer. general, b. Youngstown, Alabama. Trained for the army at W. Point Academy, he served in the Sp.-Amer. war and the campaign in the Philippines. He had risen to the rank of colonel when America entered the First World War. He landed in France as the commander of a brigade in the 1st Div. of the Amer. expeditionary force in 1917. Later in this year and in 1918 he commanded in turn the First and Second Amer. Armies, taking a prominent part in the second battle of the Marne in July 1918. He retired in 1925 from the army. Pub. *Personalities and Reminiscences of the World War*, 1925.

Bulldog, or **Bull-dog**, refractory material composed of ferric oxide and silica, made by roasting ferrous silicate (tap cinder) in air. It is used for lining the hearths of puddling furnaces.

Bulldog, breed of dog, employed for the baiting of bulls (abolished by law in 1835). It is probably a sub-variety of the mastiff, crossed with lesser breeds, and the tales concerning its descent from the hyaena may be dismissed as so much fiction. In Elizabethan times these dogs were perhaps the most sought-after Eng. breed, because of the prevalence of the sports of bull- and bear-baiting. Their ability to seize and cling to the muzzles of the animals they baited became proverbial, and was only due in part to their innate courage, as popularly conceived, the nature of the 'underbite' or locked jaw peculiar to the breed making it difficult for the animal to loose its hold when once securely fixed. There is some evidence that the B. was known in Rom. Britain. During the 18th and early 19th cents. the breed was in high favour because of its fighting propensities. But the modern B. evinces anything but a pugilistic character, and, as every breeder knows, is notorious for its good nature, especially



T. Fall

BRITISH BULLDOG

with children, who are much safer with it than with the more 'snappy' breeds. The breed is not long-lived, a B. of 6 years being considered advanced in years, and few live much beyond that age. As a watchdog the B. is useless. The points

of the modern B. are as follow: colour, white (the standard colour), brindle, fawn, brown, *not* black, which is disallowed; skull of massive proportions, deep 'stop' between the eyes, which should be placed well apart; nose black (if spotted with pink it is known as a 'dudley nose,' and tends towards disqualification); ears 'rose' or 'tulip,' neatly set and light; neck thick and short; chest well developed, legs massive, showing plenty of bone, and short, so set as to give the dog the appearance of being 'cloddy' or set near the ground; body short, tapering near the short ribs, and neatly proportional; back shaped like that of a roach; tail very short, and never carried high. The dog must be 'short-faced,' and the nose well set back—the further the better—between the eyes, and the teeth, upper and under, should be well displayed. Weight from 20 to 65 lb.

Toy Bulldogs have of recent years achieved considerable popularity as a breed, especially in France. They possess few of the characteristics of the heavier breed, with faces less 'set back,' and heavy bat-ears.



T. Fall

FRENCH BULLDOG

The *Dogue de Bordeaux* is a species of B. employed as a bull-baiter in the bull rings in the S. of France. It has the appearance of a cross between a B. and a mastiff, and is steadily growing in popularity among breeders in this country. When crossed with other breeds, especially with the mastiff, the B. tends to become vicious and even dangerous, and this cross is much in demand as a watch-dog.

Bulldog, German, *see* BOXER.

Bullen, Anne, *see* BOLEYN, ANNE.

Bullen, Frank Thomas (1857–1915), writer of sea stories, b. London. At the age of 12 he was cabin-boy on his uncle's ship *Arabella*. At 18 he signed on in the *Cachalot*, which became the scene of his best book, *The Cruise of the 'Cachalot'*, 1898, which told of the whale-fishing. At

27 he became a clerk in the London Meteorological Office, and after that produced 36 books in 17 years. Among his best are *Idylls of the Sea*, 1899, *Our Heritage of the Sea*, 1906, and *From Wheel and Outlook*, 1913. *The Log of a Sea Wolf*, 1899, is autobiographical.

Buller, Sir Redvers Henry (1839–1908), general, b. near Crediton, Devonshire. In 1860 he served in China; in 1870 in the Red R. expedition; in 1874 in the Ashanti war; and in 1878–9 in the Kaffir and Zulu campaigns. In these last he specially distinguished himself, and won the V.C. for the rescue of 3 comrades. In 1881 he served in the Boer War as chief of staff to Sir Evelyn Wood; in 1882 in the Egyptian campaign as head of the intelligence dept., and in 1884–5 as chief of staff in the Sudan war, receiving the K.C.B. in 1885. He was made quartermaster-general in 1887, and in 1890 he was promoted adjutant-general, in 1891 lieutenant-general, and in 1894 received the G.C.B. In 1898 he obtained the command of the First Army Corps and the Aldershot garrison, and in 1899 became commanding general of the Brit. forces in S. Africa, and later general officer commanding in Natal. Owing to sev. severe reverses round Ladysmith he was superseded by Lord Roberts, and after engaging in the expulsion of the Boers from Natal, returned to England in 1900. He was again commander of the First Army Corps at Aldershot, but was retired in Oct. 1901 in consequence of an imprudent speech. He left the army in 1906. He was regarded with the greatest affection by the other ranks of the army, for whose welfare he had always shown consideration. *See* C. M. Melville, *The Life of Sir Redvers Buller*, 1924.

Buller, Sir Walter Lawry (1838–1906), New Zealand ornithologist and jurist, b. New Zealand, and educ. at Wesley College, Auckland. He took a prominent place in the affairs of the Maoris and was appointed gov. interpreter at Wellington in 1855. Created magistrate in 1862; called to the Bar in 1874; received titles of F.R.S., K.C.M.G., and Sc.D. of Cambridge.

Bullet, solid projectile discharged from small-arms of all kinds, in contra-distinction to the larger missiles used by the artillery. In the old smooth-bore muskets accuracy of aim was spoiled by various difficulties, such as the pressure of the gas generated by the discharge, and the fact that the projectile must always be smaller in diameter than the bore of the gun. The smooth-bore musket fired a heavy spherical lead shot. Breech-loading B.s are slightly larger than the bore of the rifle, and cylindrical in shape. Hardened lead is suitable for velocities up to 1200 ft per sec. Modern rifles have velocities exceeding 2000 ft per sec., so projectiles are jacketed with a steel, cupro-nickel, or gilding metal envelope surrounding a core of lead. Armour-piercing B.s contain a hard steel core in a lead tube inside the envelope. Tracer B.s have hollow iron cores full of a pyrotechnic composition, then lead

tubing inside the nickel envelope. (See BALLISTICS.) Most modern B.s are of composite form, consisting of a cupronickel or coated steel envelope containing various types of filling. Filling usually consists of lead, but frequently an aluminium or a fibre tip is placed inside the nose of the B. to improve its ballistic properties. Armour-piercing B.s contain a lead sleeve and a pointed high carbon, or Tungsten carbide, steel centre giving much greater penetrating power than ordinary B.s. In tracer B.s the rear portion of the filling consists of a burning composition which is ignited by the flash of the charge and leaves a visible wake for the greater part of its flight. Incendiary B.s were developed for use against aircraft. For military purposes B. calibres range from 0.256 in. up to 1 in., beyond which size the term B. ceases to be applicable. During recent years attempts have been made to increase the ranging properties of B.s by streamlining the bases. Ranges up to 5700 yds have been thus obtained. B.s for revolvers are in some cases of the solid lead type, but for the higher-velocity automatic arms it is necessary to use the harder enveloped type. See also FIREARMS.

Bulletin, Fr. word which has been imported into the Eng. language, signifying a short authentic account of some passing event, intended for the information of the public. B. is derived from Lat. *bulia*, a seal. When royalty and other persons of high rank are dangerously ill, B.s on the state of the patient are issued by the physicians. The B. des Lois is the Fr. statute book.

'**Bulletin, The**, Australian national weekly newspaper, estab. 1880, pub. in Sydney. It has had a profound influence on Australian politics, economics, literature, and black-and-white art. Cartoonists have included Phil May, David Low, Norman Lindsay, and Ted Scofield. It pub. only original matter, and is a forthright, outspoken, independent paper. Associated is the *Australian Woman's Mirror*.

Bullett, Gerald William (1893-1958), novelist and poet, b. London. At 21 he wrote his first novel, *The Progress of Kay*, 1916. After the First World War, during which he served in the Royal Flying Corps, he studied English at Cambridge Univ., afterwards working as a reviewer. His poetical works include *Dreams o' Mine*, 1915, and *The Bubble*, 1934; he also ed. 2 poetry anthologies, *The English Galaxy*, 1933, and *Silver Poets of the Sixteenth Century*, 1947. His novels include *The History of Egg Panderville*, 1928, *Nicky Son of Egg*, 1929, *Marden Fee*, 1931, *The Quick and the Dead*, 1933, *Eden River*, 1934, *The Jury*, 1935, *The Snare of the Fowler*, 1936, *The Bending Sickle*, 1938, *A Man of Forty*, 1939, *When the Cat's Away*, 1940, *Judgment in Suspense*, 1946, *Crickets in Heaven*, 1949, *The Trouble at Number Seven*, 1952, *The Daughters of Mrs Peacock*, 1957, and *The Peacock Brides*, 1958. He also pub. sev. vols. of short stories.

Bullfinch, *Pyrrhula pyrrhula*, is a passer-

iform bird of the family Fringillidae, and differs from other finches in the thickness of its head and neck. It is small, bluish-grey or black, red or chocolate-breasted according to sex, and is a native of woods. It is a favourite cage bird, and in captivity it can be taught in the moulting season to whistle tunes (the ordinary species known as the piping finch).

Bullfrog, *Rana catesbiana*, species of Ranidae, is a N. Amer. frog which utters a bellowing noise, and thus obtains its name. It is aquatic, green in colour, and reaches a length of at least 8 in.

Bullhead, or **Miller's Thumb**, is the popular name of *Cottus gobio*, a species of the Cottidae. It is found in European waters and occurs in England, Wales, and S. Scotland. B.s are ugly, spinous fishes, with broad, depressed heads, and are of no value as food. *C. scorpius* and *C. bubalis* are common marine species in Europe and are numerous in rock pools. In America the name B. is given to members of the catfish family, or Siluridae.

Bull, tn of New S. Wales, Australia, 45 m. by rail S. of Sydney. Centre of a colliery dist. On the B. Pass is Weber's Lookout, a holiday resort. Pop. 4000.

Bullinger, Heinrich (1504-75), Swiss reformer and theologian, b. Bremgarten, the son of a priest, who himself later embraced the reformed faith. During his studies at Cologne he studied the Bible and Luther's works, and was for a time under Zwingle, whom in 1528 he accompanied to the Bern Conference. In 1529 he married an ex-nun, and was made pastor at Bremgarten, which city he gained to the Reformers. On the death of Zwingle at Cappel in 1531, he took refuge at Zürich, where he became chief pastor and champion of the Protestants.

Bullion, the precious metals of gold and silver in their refined condition, before they are coined or otherwise manufactured. The word is often extended, in speaking of exportation, to include the coined metal also. The values of B. as a means of exchange are too numerous to mention, as barter is a process which must necessarily die out at the beginning of civilisation. Gold and silver are the same in quality throughout the world; they do not deteriorate greatly with age or use; they are not so rare that the coins have to be made inconveniently small; they easily receive and retain an impress. Since gold and silver are so universally used as a medium of commerce, it has been necessary to arrange that in all civilised nations the B. should be made with a standard quantity of precious metal in proportion to its alloy. In earlier times this was not so, and in the Middle Ages commerce was frequently injured by debasement of the coinage. Though even now equal quantities of the B. of various countries are not exactly equal in value, the difference is inconsiderable.

Bullock, Alan Louis Charles (1914-), historian, educ. at Bradford Grammar School and Wadham College, Oxford. From 1945-52 he was fellow and tutor in modern hist. at New College, Oxford, and then became censor of St Catherine's. He

is well known for his broadcasts on current affairs, and his pubs. include a life of Hitler, 1952.

Bullock, Shan F. (1865-1935), novelist, b. Crom, Fermanagh. His first success was *Robert Thorne*, a mirror of the life of the average London clerk, which was pub. 1907. Other novels were *The Awkward Squads*, 1893, *The Squireen*, 1903, and *Hetty*, 1911. He also wrote a biography of Thomas Andrews, designer of the *Titanic*, and a vol. of poems, *Mors et Vita*, which appeared in 1912 and 1923 respectively.

Bullock's Heart, see CUSTARD-APPLE.

Bulls and Bears. In the slang of the Stock Exchange 'Bulls' are men who have nominally bought stock, but with no intention of paying, hoping to sell again at a profit before long. 'Bears,' on the contrary, are men who have sold stock they do not possess, hoping that a fall in prices will enable them to buy at a profit.

Bull's Eye (star), see ALDEBARAN.

Bully Tree, name given to certain trees, especially those possessing a milky juice, such as the balata and chickie gum trees. They belong to the genera *Mimusops*, *Lucuma*, *Bumelia*, etc., all of which furnish trees of considerable utility. See BALATA, GUM, etc.

Bulmer, William (1757-1830), printer of the 18th cent., celebrated for his production of the *Boydell Shakespeare*, which consists of 9 vols. folio, with a vol. of engravings called *The Shakespeare Gallery*, 1791-1805. Bewick, an intimate friend of B., engraved some of the illustrations for the vols. B. also printed other costly eds., such as *Milton* (1794-7, 3 vols. folio), and *Goldsmith* (1796, 4to), for which latter ed. Bewick also provided illustrations.

Bülów, Bernhard Heinrich Martin Karl, Prince von (1849-1929). Ger. statesman, b. Klein-Flottbeck, Holstein, and educ. at the univs. of Lausanne, Leipzig, and Berlin. He joined the army and served in the Franco-Prussian war. He then entered the diplomatic service and served in St. Petersburg, Vienna, Paris, and Bucharest (1873-88); ambas. at Rome, 1893. He was then appointed Prussian minister of state, and became Ger. imperial chancellor in 1900. He was made prince in 1905. The Reichstag having rejected his budget, he resigned in 1909. In Dec. 1914 he was sent as ambas. to Rome. When Italy joined the Allies in May 1915, B. finally retired. His memoirs, pub. in 1930-1, contain an embittered narrative of Ger. diplomacy, political corruption, and personal jealousies, but are fundamentally a lengthy justification of his own autocratic policy.

Bülów, Friedrich Wilhelm (1755-1816), Count of Dennewitz and Prussian general, was b. Falkenberg, and entered the army in 1768. He had already had fair experience of war, when in 1813 he took up arms against France. He earned great distinction at Grossbeeren, a victory gained almost entirely by his generalship, and at Dennewitz, where Napoleon's advance on Berlin was checked. In 1815

he arrived too late to share in the battle at Ligny, but he played his part in the victory at Waterloo.

Bülów, Hans von (1830-94), Ger. pianist and conductor, b. Dresden. He studied under Wieck and Liszt, and soon decided to make music his life-study. For a time he visited Wagner to study conducting, but he soon came back to Liszt, whose daughter Cosima he married in 1857. In 1864 he became chief conductor at the Royal Opera in Munich and in 1865 director of the Conservatorium. Here he organised and produced, with exceptional talent, the works of Wagner. In 1869 his wife left him for Wagner, but this did not dim his enthusiasm for that composer's work. He d. at Cairo. B. was a pianist of the very first class, and a highly gifted conductor, and his taste and critical ability were remarkable.

Bulwö, Karl von (1846-1921), Ger. field marshal, son of a Ger. military officer. He joined 2nd Guards regiment infantry, 1864; distinguished himself at Koniggratz in Austro-Prussian war, 1866; served throughout Franco-Prussian war, 1870; major-general, 1897. He began the invasion of Belgium, 1914, leading a brigade of the Second Army which occupied Liège, 7 Aug.; then marched towards the Marne, where he was driven back. During the retreat following this disastrous reverse, he was placed in command of the First and Ninth Armies—apparently to saddle him with responsibility for the failure. In 1916, at his own request, he was retired.

Bulrush is the name given to sev. plants which grow in marshy ground and bogs. The commonest of these are of the genus *Typha* (q.v.). Another B., *Scirpus lacustris*, belongs to the Cyperaceae; its stems are used for making mats, baskets, and the seats of chairs. *Pennisetum typhoides*, an Indian species of gramineae, is the pearl millet, or B.

Bulthaupt, Heinrich (1849-1905), Ger. author, b. Bremen, where he was appointed librarian of the city library in 1878. He wrote dramas, poems, and other works. His dramas include *Die Arbeiter*, 1876, *Eine neue Welt*, 1886, and *Der verlorene Sohn*, 1889. He also pub. a vol. of poems called *Durch Frost und Glut*, 1900. Other works which brought him into prominence are *Dramaturgie des Schauspielers*, 1884, which ran through sev. eds., *Dramaturgie der Oper*, and *Shakespeare und der Naturalismus*, 1893.

Bulti, see BALTISTAN.

Bulwer, Edward George Earle Lytton, and **Edward Robert**, see LYTTON.

Bulwer, John (fl. 1654), physician, was the first Englishman to write on the methods of imparting knowledge to the deaf and dumb. Except that he was himself a teacher of the deaf and dumb, nothing is known of his private life. *Chirologia, or the Natural Language of the Hand*, 1644, *Philoprophus, or the Deaf and Dumb Man's Friend*, 1648, and *Pachymyotomia, - Dissection of the Significant Muscles or Affections of the Mind*, 1649, are his chief works.

Bulwer, William Henry Lytton Earle, **Baron Dalling and Bulwer** (1801-72), Eng.

diplomat and author, elder brother of Lord Lytton, educ. at Harrow and Trinity and Downing Colleges, Cambridge. He was employed on diplomatic service at The Hague, Brussels, and Vienna, and in 1830 elected to Parliament as a Liberal. In 1837 he became attached to the Brit. embassy at Constantinople, and his success here was such that in 1843 he was made minister plenipotentiary to the court at Madrid. In 1849 he was sent to Washington, where he represented Britain in the negotiation of the Clayton-Bulwer treaty (q.v.), and in 1858 to Constantinople. In 1871 he became Baron Dalling.

Bumble-bee, see HUMBLE-BEE.

Bumboat, broad, clumsy boat employed to carry provisions, etc., from land to vessels lying in port or near the shore. They were formerly managed by women. A scavenger's boat for removing ships' refuse is sometimes called a B.

Bunbury, Sir Henry Edward (1778-1800), Brit. soldier, educ. at Westminster School. He served in the army from 1795 (when he obtained a lieutenancy) to 1829. He was under secretary of state from 1809 to 1816. He conducted an important secret mission to Wellington, and, later, was given the task of informing Napoleon that he was to be sent to St Helena. In 1830 he became member of Parliament for Suffolk. He was the author of sev. works, of which the chief is the *Narrative of Certain Passages in the Late War with France*, 1852, dealing with the Peninsular war and the period which preceded it.

Bunbury, Henry William (1750-1811), caricaturist, b. Mildenhall, Suffolk, the son of Sir Wm B. He was educ. at Westminster and Cambridge, and his faculty for caricature early showed itself. He never attempted political subjects, thus keeping himself on good terms with all parties, but his humorous drawings became so famous as to link him with his greater contemporaries Rowlandson and Gillray. He was never forced to trust to his talent for his livelihood. Examples of his work are 'The Country Club' and 'The Barber's Shop.'

Bunbury, in W. Australia, seaport and tn in the co. of Wellington; its famous harbour Koombanah has a breakwater constructed on a coral reef. Chief exports are coal, tin, timber, and agric. produce. Pop. 9870.

Bunelody, tn of co. Wexford, Rep. of Ireland, 26 m. N. of Wexford, on the R. Slaney. It is the centre for the Blackstairs Mts. Pop. 750.

Bunorana, seaside resort of co. Donegal, Rep. of Ireland, on Lough Swilly. Industries are fishing and agric. produce. Pop. 3050.

Bund (dyke), see BAND.

Bundaberg, port of Queensland, Australia, near the mouth of the R. Burnett, 270 m. N. of Brisbane by rail. It is the centre of the largest sugar-cane growing dist. in S. Queensland. Other industries include dairying, pastoral (cattle), rum, and timber. Pop. 20,400.

Bundelkhand, name formerly given to an area comprising 9 states in central

India. The prin. tn was Jhansi (q.v.). The area was the scene of much revolt and fighting in the 17th and 18 cents.

Bundesrat. This council, together with the Reichstag, formed the Federal gov. in Germany from 1871 to 1919. Its place was taken, under the Weimar Constitution, by a similar body called the Reichsrat. The B. consisted of delegates chosen by the govts. of the different states for each session, whilst the Reichstag, or popular assembly—which before the Second World War became a puppet body—contained members chosen by the people. The King of Prussia presided over both chambers under the title of Ger. emperor. The B. was the superior governing body, and could withhold measures passed by the Reichstag. Under the Nazi regime the Weimar Constitution was abolished and gov. was concentrated solely in the hands of Hitler. See CONSTITUTION, Germany.

Bundestag, federal diet (lower chamber) of the Ger. Federal Rep. since 1949, elected for 4-yearly terms by universal, direct election. It is the more powerful branch of the legislature in the rep., the upper house (Bundesrat, or Federal Council), consisting of members of the govts. of the various *Länder*, having only limited powers of veto.

Bundi, former princely state of Rajputana, now merged in Rajasthan. The Rajah of B. is now vice-president of Rajasthan.

Bundoran, tn and chief watering-place of co. Donegal, Rep. of Ireland, on Donegal Bay, 4 m. SW. of Ballyshannon. Pop. 1900.

Bundy, Edgar (1862-1922), painter. Elected an associate of the Royal Academy in 1915. His subjects are mainly historical, his pictures illustrative of Brit. sea-power being highly popular and widely reproduced.

Bungalow (Anglo-Indian word from native *Banglā*, Bengalese), a one-storeyed house with a veranda and a pyramidal roof, generally thatched. It is the kind of house in general use by Europeans in India. Dāk B.s are gov. erections for the use of travellers in the interior of India. The name is now given in England and America to light erections for seaside and holiday use, and, loosely, indeed to any dwelling-place of one storey only but with one or more rooms in the roof-space.

Bungay, mrkt tn of Suffolk on the R. Waveney. It has 2 par. churches of interest architecturally, and large printing works and malt trade. Pop. 3530.

Bungener, Louis Félix (1814-74), Fr. Protestant theologian, b. Marseilles, of Ger. parents, and studied and taught theology at Geneva. He pub. sev. novels, each intended to defend some principle of Protestantism, among them: *Un Sermon sous Louis XIV* (7th ed.), 1881; *Histoire du Concile de Trente* (2nd ed.), 1854; *Trois Sermons sous Louis XV* (6th ed.), 1902; *Christ et le siècle*, 1856; *Rome et la Bible* (6th ed.), 1860; *Calvin, sa vie, son œuvre, et ses écrits* (2nd ed.), 1863.

Bunhill Fields, public gardens and cemetery in Finsbury, London. It was

originally part of a prebendal estate belonging to St Paul's Cathedral, and in the 17th cent. became a burial-ground for dissenters. Bunyan and Defoe (qq.v.) are buried here. Opened as a public garden in 1869.

Bunin, Ivan Alekseyevich (1870-1954), Russian writer, following the Realistic tradition of the Russian 19th-cent. classics. In his youth he belonged to M. Gor'kiy's literary circle; he emigrated in 1920 and lived in Paris. His stories and novels (*The Life of Arsen'yev*, 1927; Eng. trans. *The Well of Days*, London, 1946) describe love, death, and things past with great formal brilliance. In 1933 B. was awarded the Nobel prize for literature, the only Russian writer ever to receive it. See his *Memories and Portraits*, London, 1951, and R. Poggioli, *The Art of Ivan Bunin*, 1953.

Bunion, inflamed swelling of the bursae mucosae, or synovial sacs, occurring most commonly over the metatarsophalangeal joint of the first or fifth toe. This may be accompanied by corns or suppuration, and generally causes deformity of the joint. The most common cause of B.s is pressure produced by badly fitting footgear, but the tendency may be hereditary. In bad cases a surgical operation may be necessary.

Bunium, family Umbelliferae, genus of perennial herbs, of which *B. bulbocastanum* is native to Britain and W. Europe, with edible tuberous roots, good for pigs.

Bunker Hill, small hill in Boston, Massachusetts, which gave its name to one of the earliest engagements of the War of Independence. The actual fighting took place on Breed's Hill, adjacent to B. H. The English, under Howe, only succeeded in carrying the position at the third assault, and at onerous loss. The Americans, mostly hastily levied volunteers, were under Col. Prescott. A granite column indicates the site.

Bunkering Stations. Wide commercial interests of Great Britain have long made it essential that ample stocks of fuel should be stored at convenient ports along the chief routes to the Far East and Australia, for the service of the R.N. and Mercantile Marine. As long ago as 1878 a royal commission was appointed to deal with the whole subject, and on the basis of this commission's report in 1881 adequate arrangements were made for the provision of suitable stations, especially for the service of ships travelling to and returning from the Far East. In 1889 the widening of the Suez Canal was completed, and in consequence additional ports had to be provided which involved new arrangements at Port Said, Suez, and Aden. As a great deal of anxiety was expressed concerning the unprotected nature of these B. S. in time of war, a Naval Defence Act was passed in 1889, under which powers were granted for the provision of protection from attack by sea. Further uneasiness arose on the development of aircraft during the First World War, and efforts were concentrated on giving protection to these stations against aerial attack. In the old days B. S. were

practically coal stores, estab. at convenient points, but of recent years the substitution of oil for coal as a fuel has proceeded at a great rate, so that these ports have become chiefly oil depots. This in turn has had its effect upon the Mercantile Marine, in which tankers have taken the place of colliers to a remarkable extent. Nowadays the provision of B. S. has become an international business. See OIL TANKERS.

Bunkum, mere speaking to obtain pub. in the press, or any humbug. Phrase arose in 1820, when, in the U.S. Congress, the member for Buncombe, N. Carolina, rose to speak. He had apparently nothing to say, and members began to leave. He continued, telling the others they could go also, but his electors expected a speech from him and he was only 'speaking for Buncombe.'

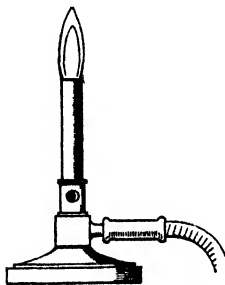
Bunner, Henry Cuyler (1855-96), Amer. poet, b. Oswego, New York State. On leaving school he took up journalism, and found his vocation on the staff of *Puck*, America's first comic weekly, with which he remained all his life, writing jokes, poems, stories, and editorials. His first pub. vol., *Airs from Arcady and Elsewhere*, 1884, was followed by *Rowen*, 1892, his best-known poem being 'The Way to Arcady.' He also wrote 2 novels, *The Midge*, 1886, and *The Story of a New York House*, 1887; and *Short Sixes*, 1890, a collection of short stories.

Bunsen, Christian Karl Josias, Baron von (1791-1860), Ger. scholar and diplomatist, b. Korbach, in the principality of Waldeck. His studies at Marburg were chiefly on theology, but in 1809 he went to Göttingen Univ., where he gave much attention to philology. In 1813 he won the univ. prize essay with the treatise *De jure Aethiopsium hereditario*. Came to Berlin in 1815, where he became acquainted with the historian Niebuhr, by whose recommendation he was, in 1818, made secretary to the Prussian embassy at Rome. Before this, he had studied Persian and Arabic under Silvestre de Sacy, and had, in 1817, married Frances Waddington, by whom his *Memoirs* were later pub. In 1824, on the retirement of Niebuhr, B. succeeded him as resident minister. During his stay at Rome, B.'s researches led him in many directions, but chiefly towards Egyptology. After leaving Rome (1838) he was for 2 years ambas. in Bern. In 1842 he was transferred to the London embassy, where he passed the remainder of his diplomatic life. He resigned because he disagreed with Prussia's attitude towards the Crimean War, and retired to Heidelberg, being made baron in 1857. Among his numerous works may be named *Die Basiliken des christlichen Roms*, 1843, *Aegyptens Stelle in der Weltgeschichte*, 1844-57. See F. von Bunsen, *A Memoir of Baron Bunsen*, 1868.

Bunsen, Robert Wilhelm (1811-99), Ger. chemist and physicist, b. Göttingen, where he pursued his early studies, afterwards completing them at Paris, Berlin, and Vienna. In 1836 he became prof. of chem. at the Polytechnic Institute of

Kassel, whence 3 years later he passed to Marburg. In 1852 he was made prof. at Heidelberg Univ., and here he spent the rest of his life. He was one of the greatest teachers of chem., but rigidly abstained from theoretical discussion. Hence no school rose under his name, in spite of the great number of his pupils who made their name as chemists. His pupils were extremely numerous, and his discoveries very valuable. The burner which bears his name is known to all. His researches on cacodyl, begun in 1837, cost him the use of one eye, and almost proved fatal. Even before this he had discovered the use of hydrated ferric oxide as an antidote to arsenic. He was also the first to obtain magnesium in a metallic state. But the greatest of his achievements was the discovery, in company with his friend Kirchhoff, of spectrum analysis, a discovery which has proved of incalculable value to both chemists and astronomers. Among his works are *Enumeratio ac Descriptio Hygrometrorum*, 1830, *Gasometrische Methoden*, 1857, and numerous pamphlets.

Bunsen Burner, burner invented by the famous chemist Robert Wilhelm Bunsen (q.v.) of Heidelberg, c. 1855, for use in the univ. laboratories so that coal gas could be burned without leaving a sooty deposit upon the articles heated.



BUNSEN BURNER

Air, about 3 vols. to every vol. of gas, is drawn into the burner tube through which the gas issues by a fine jet at the bottom. The mixture burns with a non-luminous flame and the combustion is complete. The Bunsen flame has an 'oxidising' zone, or outer envelope where oxygen is in excess, and a 'reducer' zone in the centre where unburnt gases are to be found. Such everyday apparatus as incandescent burners, gas cookers, and gas fires depend for their operation upon the use of the B. B. There are various modifications, e.g. the Moker burner in which the burner head is fitted with a nickel grid $\frac{1}{2}$ in. deep, thus giving a large number of narrow Bunsen flames. This burner allows the injection of a larger amount of air giving a very hot 'solid' flame. When supplied with compressed air at 10 lb. pressure it is very useful for furnaces,

the temp. attainable being about 1830° C. (3326° F.).

Bunsen Cell, voltaic cell which contains a plate of zinc surrounded by sulphuric acid and a carbon plate surrounded by nitric acid, the 2 plates being separated by a porous partition of unglazed earthenware. It was invented in 1841 by R. W. von Bunsen, the Ger. chemist, who employed it to produce the electric arc. It is now obsolete.

Bunt, see SMUT.

Bunter (Ger. *bunter Sandstein*, variegated sandstone), in geology, a series of rocks forming the lowest div. of the Triassic system. It consists of variegated red sandstones and conglomerates. Their prin. exposure is in Germany. They may be subdivided as follows: (1) Lower B., consisting of fine red sandstone, with a thickness of as much as 700 ft; (2) Middle B., of coarse sandstone, with a thickness of 1000 ft; (3) Upper B., of red and green marls, varying in thickness. In England it occurs chiefly in the midlands. Few fossils have been found in Eng. and Ger. beds, but plant life is represented by ferns and conifers.

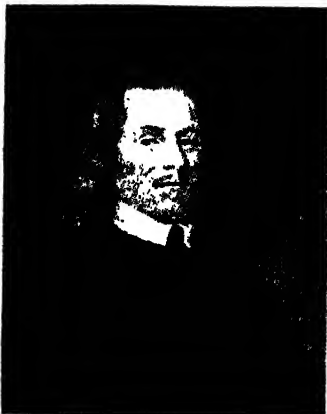
Bunting, Jabez (1779-1858), Eng. Wesleyan minister, was b. Manchester, where he entered the ministry at the age of 19. He was 4 times president of the conference, and in 1835 was made president of the first Wesleyan theological college. For 20 years he was secretary to the missionary society. He may almost be considered the founder of the Wesleyan polity.

Bunting, or *Emberiza*, is a genus of the family Fringillidae or Finches. *E. citrinella*, the yellow B. or yellowhammer, is the commonest Brit. species. The next commonest species is the Corn B. (*E. miliaria*); another species, reed-B. (*E. schoeniclus*) is common on the Norfolk broads. The Lapland B. and Snow B. (*Plectrophanes nivalis*) belong to other genera.

Buntingford, mkt tn of Hertfordshire, England, 7 m. S. of Royston, the terminus of a branch line of the railway. It has almshouses and a school for mentally defective boys. Pop. 1700.

Bunyan, John (1628-88), author, b. Elstow, near Bedford. Members of his family, under the name Buingnon, lived in Beds as far back as 1199, whilst the grandfather of his own grandfather was a certain Thomas Bonyon (fl. 1542), a 'common brewer of beer' and 'common baker of human bread.' His mother d. in 1642, and soon after this he was drafted by a local levy into the parl. army. The war at an end, he returned to his native place. He thus describes his marriage in 1649 with a religious wife: 'This woman and I came together as poor as poor might be, not having so much household stuff as a dish or spoon betwixt us both.' She brought with her a book of her father's, entitled *Plain Man's Pathway to Heaven*, which exerted a powerful influence over her husband, as may be seen in his *Life and Death of Mr Badman*, 1680. It was about this time that he underwent, like Blake and Cowper (qq.v.), strange

religious experiences. He had been very fond of ringing the bells of Elstow church, but was induced to forgo this harmless pleasure, as he believed the steeple would fall on his head did he persist in this crime. One time he was arrested in a game of tipcat by a voice which threatened him with hell if he did not repent him of his wickedness. Many long hours he spent in prayer, but it was a hard battle before he could finally renounce his pet vice of dancing on the village green. In his *Grace Abounding* he vividly describes the agony of his sufferings at this period. Dreadful hallucinations banished sleep from him at nights. He began to think, for instance, that he could have no faith unless he performed miracles, and that he



JOHN BUNYAN

would not be saved because he was not a child of Israel. But the clouds vanished and an active life healed his morbid imaginings. In 1653 he joined a dissenting community, and 2 years later began to preach in neighbouring vills. His first book, *Some Gospel Truths Opened*, 1656, is a truly remarkable production, considering that its author was the son of a tinker and unlearned in syntax and spelling. It was one of a series of controversial writings against the followers of George Fox, the Quaker. In 1666 B. was confined to Bedford co. jail as 'a common upholder of sev. unlawful meetings,' and here he remained for 12 years. He spent his time writing, and began his immortal *Pilgrim's Progress*. After the Declaration of Indulgence he was released, and was chosen pastor to his old church, but when the declaration was repealed, he was sent to the tn jail for 6 months, because he was a Nonconformist preacher. On regaining his freedom he took up his pastoral work once more, and continued it till his death on Snow Hill, Holborn. He was buried in the gloomy graveyard of

Bunhill Fields. Whilst his *Holy War*, 1682, is only inferior to *Pilgrim's Progress* as an allegory, the latter is, of course, his masterpiece. (B. actually wrote some 60 books, but only these two and *Grace Abounding* continue to be read.) Pub. in 1688 (the second part in 1684), it was at once appreciated by the common people, though it was some time before men of letters recognised the homely beauty of its biblical language, its spirited dialogue and vivid characterisation, its imaginative descriptions, as for example of the Delectable Mts and Vanity Fair, and above all the passion of its religious fervour. Christian's pilgrimage from the City of Destruction to the Celestial City has brought comfort and joy to men all the world over. That there is a peculiar fascination about the pilgrim is not to be denied, even by those who may be averse to B.'s religious opinions. Of this latter we have a striking instance in Dean Swift, who once wrote: 'I have been better entertained, and more informed, by a few pages in the *Pilgrim's Progress*, than by a long discourse upon the will, and the intellect, and simple and complex ideas.' See also Cowper's moving lines on the pilgrim, beginning, 'O thou, whom, borne on fancy's eager wing.' There are eds. of B.'s works by C. Doe, 1692, G. Offer, 1853, 1862, and H. Stebbing, 1859; lives by R. Southey, 1830, Lord Macaulay, 1850, J. A. Froude, 1880, John Brown, 1885, C. H. Firth, 1911, and H. Talon, 1951. See also G. B. Harrison, *John Bunyan: a Study in Personality*, 1928; J. Lindsay, *John Bunyan: Maker of Myths*, 1937; M. P. Willcocks, *Bunyan Calling: a Voice from the Seventeenth Century*, 1943.

Bunyoro, dist. in W. prov. of Uganda. Part of B. forms a national park. Its area is about 5600 sq. m. and the native pop. about 100,000. Masindi is the chief tn.

Bunzlau, see BOLESŁAWIEC.

Buonarroti, Michael Angelo, see MICHEL-ANGELO.

Buonarroti, Michelangelo the Younger (1568-1646), It. playwright, nephew of the great Michelangelo, b. Florence. He studied mathematics and natural philosophy under Galileo, and became a member of the Accademia della Crusca and of the Florentine Academy. He is chiefly famous for *La Tancia*, 1612, rustic comedy, and *La Fiera*, 1618, comedy written in free verse.

Buonfede, Appiano (1716-93), It. philosopher, was appointed to a professorship of theology at Naples in 1740. Later he joined the Order of Celestines, and became, in course of time, general of that order. His *Della Restaurazione di ogni Filosofia ne' Secoli*, 1789, one of many works, gives a good account of 16th-cent. It. philosophy.

Buoninsegna, see DUCCIO.

Buononcini, Giovanni, and **Giovanni Maria**, see BONONCINI.

Buoy, anchored floating body used as a guide to navigation or for the purpose of mooring ships. Mooring-Bs are made of wood or iron, and are used in places

where anchorage is impossible or inconvenient. The more important use of B.s, however, is to mark the limits of a navigating channel, or to indicate the existence of dangerous obstructions, e.g. rocks, shoals, sunken wrecks, etc. B.s may be differentiated by colour, shape, or the attachment of a signalling apparatus, as whistles, bells, fixed or flashing lights, etc. The following general principles are adopted in the use of B.s in the U.K.: B.s showing a conical top above water are called conical B.s, and should be kept on the starboard-hand; B.s showing a flat top above water are called can B.s, and should be kept on the port-hand; B.s showing a domed top are called spherical B.s, and mark the ends of middle-grounds. In the above definition, starboard-hand means the right side of the vessel in ascending a riv. or estuary, or in going with the main stream of the flood of the tide on the coast. In Scotland it is established that conical B.s should be painted red and can B.s black; spherical B.s are painted with horizontal white stripes throughout the U.K. B.s bearing bells, lights, whistles, or distinguishing structures other than the foregoing are used for special positions. Bell-B.s are actuated by the undulating of the waves; lights are provided by compressed oil gas, though acetylene and electricity are sometimes used; whistling is effected by the provision of a hollow cylinder extending some 30 ft downwards; the up and down motion of the B. produces an inhalation and expulsion of air from this chamber, and the whistle is blown in a fitful manner corresponding to the motion of the waves. Wreck B.s are painted green, and bear the word 'wreck'.

Buoyancy, that property by which a body tends to float in a fluid. The force upwards on a floating body is equal to the weight of the body, and that weight is equal to the weight of the water displaced by the immersed part (Archimedes' principle). Apparent loss in weight of an immersed body is shown by Archimedes' principle to equal weight of liquid displaced. If a ship has a certain draught line to which it may safely be loaded, the measure of its B. may be taken as the additional weight required to bring the draught line on a level with the water. To ascertain the true weight of a body, a correction must be applied to the weight in air, to allow for the B. of the air. This correction is zero if the body has the same density as the weights, but may be as much as 6 milligrams per gram weight of a body of sp. gr. 0.2 (using brass weights).

Bupalus (fl. 540 BC), Gk sculptor, with whom his brother, Athenis, is always associated, belongs to the school of sculpture in Chios at a time when its hist. just ceases to be legendary. The brothers never advanced to the representation of the nude; all their figures (carved in marble) were draped. B. did a figure of Tyche (Fortune) and also the Graces for the temple of Nemesis in Smyrna.

Bupalus, genus of lepidopterous insects of the family Geometridae, in which the wings are erect in repose and the larvae

have 10 legs. *B. piniarius*, the bordered white moth, is a beautiful species found in the vicinity of fir-trees.

Buphaga is the type genus of birds of the family Buphagidae. *B. africana*, the ox-pecker, is generally seen in companies of 7 or 8, attending a herd of buffaloes or antelopes.

Bupleurum, family Umbelliferae, a genus of herbs or shrubs, found in Europe, Asia, Africa, and N. America. *B. rotundifolium*, Hare's Ear or Thorow-wax, an ann., with perfoliate upper leaves; *B. tenuissimum*, Smallest Hare's Ear, ann.; and *B. falcatum*, perennial, are native to Britain. *B. fruticosum* is an evergreen shrub, from the Mediterranean region, now naturalised in a few localities.

Buprestidae is the name of a family of coleopterous insects of about 5000 species, which have short antennae and are very brightly coloured. Green is the most common colour, but blue, red, gold, and copper are also frequent, and have a burnished appearance. They live on the trunks of trees, crawl slowly, but when on the wing fly rapidly.

Bur, or **Burr**, slight ridge of metal raised on edges of a line engraved by the burin, rocker, or dry point. It is usually removed by a scraper, as it retains too much ink in printing the plate, producing the effect of a smear. Sometimes it is left to produce a peculiar effect of its own (see ENGRAVING, *Drypoint*). Seymour Haden and other etchers often keep it; so does Rembrandt. In mezzotint engravings (see MEZZOTINT) the whole effect comes from the bur.

Bur, or **Burr**, is the name given to a fruit which has developed a process like a hooked spine to aid it in its distribution. *Arctium lappa*, the burdock, is a common example, as is also the horse chestnut. In Scotland the word is applied to the thistlehead and to the firecone.

Bur-reed is the name applied in England to *Sparganium*, a genus of plants of the family Sparganiaceae, common to Europe, Asia, and America. Four species occur in Britain: the Branched (*S. ramosum*), Unbranched Upright (*S. simplex*), the Floating (*S. angustifolium*), and Small B. (*S. minimum*). They occur in ditches and shallow ponds of Britain.

Buran, very violent sandstorm or snowstorm occurring in central Asia, in the Caucasus, and on the outskirts of Siberia. The storm heralds itself in a peculiar manner, and comes on quite suddenly. The sky becomes inkly black, and the atmosphere is choking, on account of the clouds of fine sand blown along by the wind, which tears along at a remarkable velocity. Sometimes the wind brings along in its train fine particles of partially frozen snow and is then called *poorga*. There are 2 kinds of B., the kara-B. or black storm, and the sarik-B. or yellow storm.

Burano, It. tn. in Veneto (q.v.), 5 m. NE. of Venice (q.v.). It is built on 4 small is., and is famous for its lace. Pop. 5000.

Burbage, James (d. 1597), one of the most famous actors of Elizabethan times.

He was the builder of The Theatre in Shoreditch, and the Blackfriars Theatre in 1596.

Burbage, Richard (1567-1619), great Elizabethan actor, son of the above; in spite of his short and stout figure, he played with immediate success the leading parts in most of Ben Jonson's dramas, and was famous for his impersonations of Hamlet, Lear, Othello, and, above all, Richard III. He also built, with Shakespeare's financial help, the Globe Theatre, using materials from the structure of The Theatre which he pulled down for that purpose.

Burbank, Luther (1849-1926), Amer. plant-breeder, b. on a farm at Lancaster, Massachusetts. Began market gardening as a youth. In 1875 estab. a plant nursery at Santa Rosa, California. He gave up business in 1893 to devote himself to plant-breeding experiments, by which he gained world-wide celebrity. B. introduced many famous varieties, especially the B. potato. See BREEDING.

Burbot, or Eel-pout, common name of *Lota lota*, a species of the Gadidae, or cod family, related to the whiting, haddock, and ling, and remarkable as being the only fresh-water fish of its family. It is common in European and Amer. streams, and is found in Great Britain chiefly in the Ouse and Cam.

Burchiello (real name *Domenico di Giovanni*), It. comic poet, b. Florence c. 1404, d. Rome in 1449. By trade a barber, his shop became the meeting place of the literary wits in Florence. B. is a satirist, and his poems are sonnets of the comic burlesque type, often licentious. Like many humorous poets, his life was spent in poverty, although his sonnets were very popular at the time.

Burckhardt, Jakob (1818-97), Swiss historian and art critic, b. Basel. He was educ. at Berlin and Bonn, and was a prof. of hist. at Basel Univ. for nearly 50 years. His first important work was pub. in 1842, and dealt with the works of art in Flemish cities. His masterpiece is his *Die Kultur der Renaissance in Italien*, 1860, a brilliant survey of the period, in spite of some serious omissions. It remains one of the standard authorities on the subject. It was the compilation of his *Cicerone* or art guide to painting in Italy, first pub. in 1855, that led to his further study of the Renaissance and to the writing of *Die Kultur* and also of his *Geschichte der Renaissance in Italien*, 1867. See K. Jöhl, *Jakob Burckhardt als Geschichtsphilosoph*, 1918, and W. Behm, *Jakob Burckhardt*, 1930.

Burckhardt, John Lewis (1784-1817). Anglo-Swiss traveller. He had a good educ. and as one of the sons of an eminent Basel family, a choice of many careers was open to him. He accepted the offer of Sir Joseph Banks, a member of the African Association, to explore the hinterland of Africa. Disguising himself as a Muslim, he spent 2 years in Asia, during which he acquired so complete a mastery over Arabic and over the contents of the Koran that he passed among the natives themselves as a learned doctor of their

law. After visiting Palmyra, Damascus, and Lebanon he went to Cairo. In 1812 he went up the Nile as far as Mahass, and after traversing the Nubian desert, succeeded, under the guise of a Syrian merchant, in making the pilgrimage to Mecca, by way of Jeddah. He also journeyed to Mt Sinai, but was prevented by death from joining the caravan which travelled towards Fezzan, whence he had intended to explore the sources of the Niger. He was a man of genuine greatness of mind and high principles of honour, qualities which, allied to his capacity for learning and power of observation, enabled him to overcome difficulties which would have baffled lesser men. The results of his travels were pub. in 1819 in *Travels in Nubia* by the Association for Promoting the Discovery of the Interior Parts of Africa; *Travels in Syria and the Holy Land*, 1822, *Travels in Arabia*, 1829, and *Notes on the Bedouins and Wahabys*, 1830.

Burdekin, riv. of Queensland, Australia, rises not far from the coast, to which it runs almost parallel till it empties itself in Upstart Bay.

Burden, law term in Scotland signifying any encumbrance or restriction on property of any kind. The most important B.s are those which affect land, such as stipend, land tax, and feu-duty (q.v.).

Burdett, Sir Francis (1770-1844), Eng. politician, educ. at Westminster and Oxford. The Fr. Revolution probably did much to mould his political opinions. He entered Parliament in 1796, having 3 years earlier married the heiress of the banker Coutts, and became well known for his radical opinions. He was arrested by order of the House for breach of privilege, having had one of his speeches pub., and taken to the Tower, where he was kept a prisoner until the prorogation of Parliament. His prin. political ideals were the passing of a reform bill and the relief of Catholic disabilities. In 1820 he was again imprisoned for his denunciation of the Manchester massacres, and was fined £1000 and imprisoned for 3 months. He saw the Catholic Relief Bill passed in 1829, after he had made vain attempts to pass a similar measure in 1825, 1827, and 1828. See life by M. W. Patterson, 1931.

Burdett, Sir Henry Charles (1847-1920), author and statistic; son of Rev. Halford B., M.A., of Gilmorton, Leicester co.; made K.C.B., 1897, and K.C.V.O., 1900. At one time superintendent of the Queen's Hospital, Birmingham, and of the Seaman's Hospital, Greenwich. Many pub. on financial topics, including *Burdett's Official Intelligence of British, American, and Foreign Securities* (17 vols.), *The National Debt, Local Taxation in England and Wales, National Debts of the World, Municipal, County, and Indian Finance, and Seventeen Years of Securities*.

Burdett - Coutts, Angela Georgina, Baroness (1814-1906), daughter of Sir Francis Burdett, b. London. In 1837 she inherited almost all the great wealth of her grandfather, Sir Thomas Coutts, left by the will of his widow, the Duchess of St Albans, once Henrietta Mellon, the actress. Many offers of marriage were

made her, but she resolved to remain single, and to devote her vast wealth to the cause of philanthropy. In 1881, however, she married Wm Ashmead-Bartlett (1851-1921), who assumed her name, and was sev. times elected as member of Parliament for Westminster. In 1871 she was created a peeress, and in 1872 she was presented with the freedom of the City of London, being the first woman to receive this privilege. She d. on 30 Dec. 1906, and was buried at Westminster Abbey. Her philanthropic exertions were on such a vast scale that it is difficult to find any dept. of life they did not touch. She endowed the 3 bishoprics of Cape Town, Adelaide, and Brit. Columbia. Her love for her own sex caused her to do much for reformatories, and to secure great improvements in the education of girls at the national schools. Her interest in emigration was great, and she did much to aid in this work. See C. Dickens, *Letters to Baroness Burdett-Coutts, with biographical introduction*, 1931.

Burdigala, see BORDEAUX.

Burdock, or *Arctium lappa*, is a common Brit. species of Compositae which is often found growing by roadsides. It occurs also in Asia and on the Continent. *A. minus* is the Lesser B., and *A. vulgare*, the Wood B. All are tall, biennial herbs, with large, spirally arranged ovate leaves, reddish-purple flower heads, ripening into fruits with achenes hook-tipped for animal dispersal. See BUN.

Burdon-Sanderson, Sir John Scott (1828-1905), physiologist, b. Jesmond, Newcastle upon Tyne. Second son of Richard Burdon, who took the additional name of Sanderson on his marriage with Elizabeth, only daughter of Sir James Sanderson, 1st baronet, M.P. He went to the univ. of Edinburgh in 1847, came to London as practising physician in 1853, and was appointed medical registrar, then lecturer, at St Mary's Hospital, London. In 1867 elected fellow of the Royal Society and Croonian lecturer. In 1870 devoted himself to scientific research. Initiator of new Eng. school of experimental physiology. In 1882 he was appointed first Waynflete professor of physiology at Oxford, and was Regius professor of medicine there, 1895-1903. He was especially interested in the study of the functions of living tissues; he investigated the electrical currents produced by the heart; and he measured the speed of the nervous impulse. Created baronet, 1895. See memoir by Lady Burdon-Sanderson and others, 1911.

Burdwan, tn in W. Bengal, India, 67 m. from Calcutta. It is principally known as the residence of the Maharajah of B., one of the great landlords of Bengal. The dist. of the same name includes the great coalfields of Bengal and Bihar, one centre being at Raniganj, and a big steel work at Asansol.

Burdy, Samuel (c. 1760-1820), Brit. author. Curate first at Ardglass, co. Down, 1783, he was promoted to Kilclief c. 1800. His *Life of the Rev. Philip Skelton*, 1792, is one of Ireland's literary treasures. Amongst other poems, he

wrote *Ardglass, or the Ruined Castles*, 1802.

Bure, riv. in Norfolk, England, flowing SE. through the Broads (q.v.) to Breighton Water at Yarmouth. Length 50 m.

Bureaucracy, term signifying gov. by depts, each ruled over by its separate chief, as opposed to gov. by ministers, owing a collective or associated responsibility to the people, and hence the word is often loosely used to mean officialism, red-tapeism.

Burette, apparatus used in practical chem. for delivering measured quantities of a liquid. It consists of a graduated cylindrical tube fitted with a stop-cock. A small glass float with a fine horizontal line engraved upon it may be used at the surface of the liquid to indicate the extent of movement of the top of the column with greater accuracy.

Burford, tn on the Windrush, in the Woodstock div. of Oxon., England. Historical interest attaches itself to B. Priory, and also to the place itself, as the scene of the overthrow of Ethelbald of Mercia by Cuthred of Wessex (AD 752). B. was obliged to send a member to Parliament in 1306, but petitioned to be excused henceforth and was so. The anct. corporation was dissolved in 1861. The seal dates from about 1250. The church of St John the Baptist possesses a fine Norman tower. B. has many interesting examples of medieval domestic architecture. Pop. 1000.

Burg, Ger. tn in the dist. of Magdeburg, on the Elbe canal, 13 m. N.E. of Magdeburg (q.v.). It has a 12th-cent. church, and has textile and chemical manufs. Pop. 30,000.

Burgage Holding and Tenure. *B. tenure* denotes the particular feudal service or tenure of houses or tenements in anct. cities or bors. The incidents of this tenure, which prevailed in Normandy as well as in England, vary according to the particular customs of each bor. (q.v. and **BURGESS**). It is generally considered to be a species of socage tenure, as it was usually held either at a pecuniary rent or for services having no relation to military service. The later importance of the tenure was mainly in regard to the bor. franchise. *B. holding* is one of the forms of feudal tenure in Scotland, and is that by which burghs-royal (see **BURGHS**) hold of the Crown the lands contained in their charters of erection. Property held on this tenure is at the present day practically all allodial.

Burgas, tn of E. Bulgaria, cap. of B. prov. (area 5258 sq. m.), on the Gulf of B., an inlet of the Black Sea, 228 m. E. of Sofia (q.v.). It is in a copper-mining dist., has manufs. of textiles, agric. machinery, and metal goods, and is a busy fishing and commercial port. Pop. 44,000.

Burgdorf (Fr. Berthoud), tn in the canton of Bern, Switzerland, on the R. Emme, 14 m. N.E. of Bern. It has silk and cloth-making industries. It is a picturesque tn, and its castle was the seat in which Pestalozzi (q.v.) set up his school, 1798-1804. Pop. 12,800.

Burgee, small pennant used by yachts and pointed or swallow-tailed according to the owner's status. B.s. of clubs are invariably pointed, that of a commodore or vice-commodore swallow-tailed. Only the royal yacht squadron may fly the white ensign, but other royal clubs may have a crown on the B.

Burgenland, prov. of E. Austria. In the N. it is generally flat, but in the S. are spurs of the Alps, with the valleys of the R. Raab and its tribs. The ownership of this area was in dispute after the First World War, Czechoslovakia and Yugoslavia desiring it as a connecting link, Hungary claiming it on historical and Austria on ethnographical grounds. It was allotted to Austria by the treaties of St-Germain-en-Laye and Trianon (q.q.v.). After the Second World War it was included in the Russian zone of occupation of Austria. The prov. is mainly agric., but some coal is mined. Eisenstadt (q.v.) is the cap. Area 1532 sq. m. Pop. 276,150. *See also* SOPRON.

Bürger, Gottfried August (1747-94), Ger. poet. He began to study theology at Halle, but later studied jurisprudence at Göttingen. Only his friendship with poets from the *Göttinger Dichterbund* saved him from a life of dissipation, and he pub. his first poems in the *Musenalmannach*, of which he himself became editor in 1778. As a ballad writer his popularity spread far and wide; he may be said to have introduced the ballad into Ger. literature. Such ballads as *Lenore*, *Der wilde Jäger*, and *Das Lied vom braven Manne* are almost unequalled for dramatic intensity, virility of style, and atmospheric suggestiveness. His *Sämmtliche Schriften* were ed. by W. von Wurzbach (4 vols.), 1796-1802.

Burgers, Thomas François (1834-81), president of the Transvaal, a native of Cape Colony, and minister of the Dutch Reformed Church. Elected president by the Boers, 1872, in a most critical period of the hist. of the Transvaal. Kruger systematically opposed B.'s policy, with the result that the Boers refused to pay taxes, and entered into warfare with Secocoeni, a native chief. Transvaal was also menaced by the Zulus. At this crisis England appointed Sir Theophilus Shepstone to inquire into matters: B. was compelled to resign, and the annexation of the Transvaal was formally declared in 1877.

Burges, William, A.R.A. (1827-81), architect, b. London, travelled abroad, and started practice in London, c. 1856. He became a prominent figure in the 'Gothic Revival', and carried his medieval tastes into the eccentric house that he built for himself in Melbury Road, Kensington, 1875-80. His prin. building were the (Protestant) cathedral of St Finbar at Cork, Ireland, 1863-70; the picturesque restoration of Cardiff Castle, 1865; the mansion of Castle Coch, Wales, c. 1875; the Speech Room at Harrow School, 1877; small churches at Skelton and Studley, both in Yorks, 1871, etc.

Burgess, Frank Gelett (1866-). Amer. humorist, b. Boston. He was educ. at the Institute of Technology and worked

for a time as a draughtsman and as a drawing instructor. From 1894 to 1897 he ed. the *Lark*, a magazine in which appeared his famous quatrains about the Purple Cow. A collection of poems for children, *Goops and How to Be Them*, 1900, was followed by *More Goops*, 1903, and *New Goops*, 1940. *Are You a Bromide?*, 1897, is a satire on platitudes, and *Burgess Unabridged*, 1914, introduced a number of new words, one which has become accepted being 'blurb,' which he interpreted as 'self-praise; to make a noise like a publisher.'

Burgess, Guy Francis de Monoy, *see* BURGESS and MACLEAN CASE.

Burgess, John Bagnold (1829-97), painter, b. London. He studied in the Royal Academy, and later lived for some years in Spain, whence he chose the greater part of his subjects. A.R.A., 1877, R.A. 1889. Among his best-known pictures are 'Bravo Toro,' 1865, 'Stolen by Gypsies,' 1868, 'Visit to the Nursery,' 1870, and 'Licensing Beggars in Spain,' 1877.

Burgess, John William (1844-1931), Amer. historian, b. Giles co., Tennessee. Educ. at Amherst College and at Göttingen, Leipzig, and Berlin. Appointed in 1873 prof. of hist. and political science at Amherst. Later, prof. of political science and constitutional law at Columbia College. Works include *Political Science and Comparative Constitutional Law*, 1890, *The Middle Period*, 1817-58, *The Civil War and the Constitution*, 1859-65, *Reconstruction and the Constitution*, 1866-1876, trilogy, 1897-1902, *Recent Changes in American Constitutional Theory*, 1923, and *The Sanctity of Law—Wherein Does It Consist?*, 1929.

Burgess, (Low Lat. *burgensis*, citizen; old high Ger. *burg*, tn) formerly meant simply an inhab. of a bor. or a leading craftsman in a guild belonging to a bor. Gradually the term B. came to be applied to a freeman of a bor. possessing a tenement in a bor. The early importance of B.s. lies in the fact of their inclusion as one constituent part of the Third Estate of the Realm or Commons in Parliament. In 1264 Simon de Montfort, in issuing writs for a parliament in London, summoned for the first time 2 citizens from each city and 2 B.s. from each bor. to sit with the knights of the shire, thus eliminating the barrier which had hitherto kept them apart. From this union springs the bulk of our national liberties. The B.s. or representatives of bors. attended parliament regularly from the time of the Model Parliament, 1295. The creation in 1835 of the 'municipal corporation' as a unit of self-gov. included that of a uniform qualification for the municipal franchise. That qualification is known as the old B. qualification, and is now practically the same as, but not necessarily co-extensive with, the parl. franchise. The qualification of a B. is enrolment on the Register of Electors as a resident on 10 Oct. in any year. Women may be B.s., and are now also eligible for corporate office. Where the bor. is a city, the B.s. are called citizens. *See also* BURGH and LOCAL GOVERNMENT.

Burgess and Maclean Case. On 25 May 1951, 2 Brit. foreign office officials, Donald Maclean (b. 1913) and Guy Burgess (b. 1911) left the country in mysterious circumstances, later information suggesting they had fled to the Soviet Union. On 11 Sept. 1953, Maclean's Amer. wife, with her children, disappeared from her Swiss home in equally mysterious circumstances, presumably to join her husband. Maclean had had access to secret information and was the son of a former Cabinet Minister. The affair caused a good deal of scandal, and in Sept. 1955 Petrov, a former Soviet diplomat, pub. an article in a Brit. newspaper stating that Burgess and Maclean had been Soviet spies since their undergraduate days at Cambridge. The gov. then issued a White Paper, disclosing that Maclean had been under suspicion when he disappeared, but this was generally considered evasive in character. In 1956 the two 'missing' men gave a news conference in Moscow.

Burgess Hill, tn in Sussex, England, 10 m. N. of Brighton. Pop. 9000.

Burgh, Hubert de (d. 1243), Eng. administrator. He was a loyal servant of Richard I and John, urging the latter to sign the Magna Carta. In 1215 he became justiciar, and during the war with France he defeated the Fr. fleet off Dover, 1217. During Henry III's minority B. was the virtual ruler of England, but his rigorous gov. made him many enemies and in 1232 the king imprisoned him. Though he was later pardoned and his titles restored, he never recovered his old position of favour at court.

Burgh, Scottish tn possessing incorporation (corresponding to the Eng. 'borough') and a local (generally petty) jurisdiction. Formerly only royal B.s could send representatives to Parliament, but since 1832 there have been parl. B.s or tns not being royal B.s but sending representatives to Parliament, e.g. Falkirk, Leith, Hamilton. The General Police Act for Scotland extends the meaning of B. and defines it to mean all B.s and populous places whose boundaries have been fixed. The Act further provides that the sheriff may, on the representation of 7 or more householders, fix the boundaries, and thereby constitute a B. for purposes of local gov. The jurisdiction of B. magistrates is practically restricted to police offences, payment of B. dues, and summary ejections. See W. M. Mackenzie, *The Scottish Burghs*, 1948.

Burghhead, burgh and fishing port of Morayshire, Scotland, on the Moray Firth some 8 m. from Elgin. Pop. 1367.

Burghley, William Cecil, see BURLEIGH, 1ST BARON.

Burgin, George Brown (1856-1945), Brit. author. He was secretary of Authors' Club, 1905-8, and wrote many books, amongst which may be mentioned *The Judge of Four Corners*, 1896, *The Belle of Santiago*, 1911, *Dickie Dileer*, 1912, *The Duke's Stratagem*, 1931, and *A Pious Fraud*, 1938.

Burgkmaier, Hans (1473-1531), Ger.

painter and wood-engraver, b. Augsburg, was a friend of Albrecht Dürer, and father-in-law to Holbein the elder. His renown rests on his woodcuts—nearly 700 in all—which are truly remarkable for their faithful presentation of contemporary life, and for their dramatic strength. Especially noteworthy are his engravings for *The Triumph of Maximilian*, and for a Ger. trans. of Petrarch's Lat. treatise *De Remedii utriusque Fortunae*. A portrait of himself and wife may be seen in Vienna, whilst the galleries of Munich, Berlin, and Augsburg, his native place, possess examples of his work in fresco painting.

Burglary (etymology uncertain). In O.E. law B. was known as *hamsoeca*, in Eng. common law is defined as the breaking and entering a dwelling-house by night, with intent to commit a felony. *Breaking* may be either by forcing open a closed window, door, etc., by some necessary aperture such as a chimney, or by collusion with a servant or inmate of the house. It may be before the felony, to secure entrance, or after it, to secure escape. For *entry* it is sufficient that the hand or arm should be inserted. A *dwelling-house* is any permanent building in which the owner or some tenant sleeps. Any building or outhouse forms part of the dwelling-house only if it be connected with the same either directly or by an enclosed passage. *Night* is defined as the period between 9 p.m. and 6 a.m. The maximum punishment for B. is imprisonment for life. If the offence be committed by day, or in some place other than a dwelling-house, it is not B., but housebreaking. In Scotland all cases fall under the law of housebreaking, and the name 'B.' is not used. In the U.S.A., on the contrary, B. is made to cover many cases of housebreaking, and is never punished by penal servitude for life.

Burgomaster, title of chief magistrate of a Dutch, Flemish, or Ger. tn. It corresponds to the Eng. 'mayor' and Scottish 'provost.'

Burgon, John William (1813-88), Eng. clergyman, b. Smyrna. His father, a merchant, moved to London in 1814. Burgon went in 1841 to Oxford, where he won the Newdigate with a poem on *Petra*, and became a fellow of Oriel. In 1863 he became vicar of St Mary's, the univ. church, in 1867 Gresham prof. of divinity, and in 1876 dean of Chichester. *Lives of Twelve Good Men*, 1888, was his best-known work.

Burgos: 1. Sp. prov., in Castilla la Vieja (q.v.). It is a tableland crossed by ranges of high mts, with a severe climate and a barren soil, and is watered by the Ebro and the Duero (q.v.). The inhab. are mainly occupied in stock-raising and agriculture. Area 5180 sq. m.; pop. 401,804.

2. Sp. tn, cap. of the prov. of B., on the Arlanzón. Founded in the 9th cent., it became the cap. of the countship, later the kingdom, of Castile (q.v.). It gradually gave way in importance to Valladolid and then to Madrid. It was taken in 1808 by the French, who retained it until

1813 despite 4 sieges by Wellington. It was in B., in July 1936, that Gen. Franco set up his insurgent gov. (see SPAIN, *History*).

B. is the city of the Cid (q.v.), who is said to have been married in the castle the remains of which stand above the tn. Edward I (q.v.) of England also was married in this castle. The magnificent Gothic cathedral, rich in fine sculpture, with 2 spires and 15 chapels, was begun in 1221. There are numerous other beautiful old buildings, including churches, convents, and mansions. Textiles, paper, pottery, and leather are manuf., and the tn has a large trade in agric. produce. Pop. 77,950.

Burgoyne, John (1722-92), general. He entered the army at an early age, and was also at an early age compelled to sell out in order to pay his debts. His youth was further distinguished by his runaway marriage with the daughter of the Earl of Derby. He spent the years following the sale of his commission abroad, but was, by the influence of his father-in-law, restored to his rank in the army in 1758. He became the first commander of light infantry in the Brit. Army in 1759. He became an M.P. in 1761, and was made a brigadier-general in the following year. At the close of the Seven Years War he devoted his time to politics and the drama, his first play being produced in 1775. In that year, on the outbreak of hostilities with the Amer. colonists, he was appointed to the command of a div., and made a fatal attempt to attack the colonists from Canada. He was surrounded at Saratoga by Gen. Gates and the Amer. Army, and forced to surrender with 3500 men. He was deprived of his appointments, but these were restored to him in 1782. He retired, however, into private life, and occupied his time with dramatic work. His most popular work, *The Heiress*, appeared in 1786. In 1808 his poetical and dramatic works were pub. See W. L. Stone, *Campaign of Lieut.-Gen. J. Burgoyne*, 1877, and F. J. Hudleston, *Gentleman Johnny Burgoyne*, 1927.

Burgoyne, Sir John Fox (1782-1871), field marshal, a natural son of John B. (q.v.) and Susan Canfield, an opera singer. Educ. at Eton and Woolwich. He obtained his commission in 1798, and 2 years later served in Abercromby's expedition to the Mediterranean. He joined Wellesley in Portugal in Feb. 1809, was present at the passage of the R. Douro and the taking of Oporto, being promoted captain. His military skill at the sieges of Badajoz and Ciudad Rodrigo won him the rank of lieutenant-colonel in 1812. Chairman of the Irish Board of Public Works, 1831-45. Later he served with distinction at the Crimea, and was promoted to general in 1855, and created a baronet in 1856. Field marshal, 1868. See life by Lt.-Col. G. Wrottesley, 1873.

Burgstädt, Ger. tn in the dist. of Karl-Marx-Stadt, 8 m. NW. of Karl-Marx-Stadt (q.v.). It has an anct textile industry, and has manufs. of sewing-machines. Pop. 20,000.

Burgsteinfurth, Ger. tn in the *Land of*

North-Rhine-Westphalia (q.v.), near the Dutch border, 68 m. N. by E. of Düsseldorf (q.v.). It has a fine castle and textile manufs. Pop. 7000.

Burgundil, The, Ger. tribe originally inhabiting an area between the Vistula and the Oder. They settled around the source of the Main about 400. Although they took part in the great barbaric invasion of Rome in 406, they were often loyal allies of the Romans against the Huns and Franks. In 475 they occupied the Rhône valley. They had already adopted Christianity before Clotaire, the Frankish king, finally put an end to their kingdom in 534.

Burgundy, Duke of, see PHILIP THE BOLD and PHILIP THE GOOD.

Burgundy, formerly an independent monarchy, and later a prov. of France. Its earliest inhab. were a Ger. tribe, the Burgundil (q.v.), who had extended their settlement from the banks of the Oder and Vistula to the Rhine and Neckar. A defeat by the Huns, followed by the chaos resulting from the decay of the Rom. Empire, saw them holding sway over the whole of the Rhône valley. They accepted Christianity later, and in 534 were conquered by the Franks. In 832 B. regained its independence and gradually attained great power; but a later absorption of the prov. by the Germans saw its gradual decomposition into a number of small states, all of which were finally taken over by France. It now comprises the depts of Ain, Côte-d'Or, Saône-et-Loire, with parts of Yonne, Aube, and Haute-Marne, and is world-famous for its wines. Its prin. tns are Dijon, Mâcon, Autun, Châlon-sur-Saône, and Bourg, and it is watered by the Rhône, Seine, and Loire Rs.

Burgundy Pitch (a misnomer, as it comes from Finland and the Black Forest), yellowish-white resin prepared from common frankincense, the exudation of the Norway spruce-fir (*Abies excelsa*), by melting it in hot water and separating it from the greater part of the oil which it contains. B. P. is hard and brittle, and can be distinguished from its many imitations by its pleasant smell and lack of bitterness. It is used in medicine for plasters, and acts as a mild irritant.

Burgundy Wine, sometimes called the king of wines (claret being the queen), grown within the boundaries of the anct prov., the finest, both red and white, coming from the Côte d'Or dept (q.v.). The chief vineyards cover the slopes of the Côte de Nuits on the N., where the very finest wines are grown, and the Côte de Beaune on the S., where cheaper though excellent growths such as Pommard and Volnay are found. The great Burgundy grape is the *pinot* which is also responsible for champagne. Among the greatest wines from the Côte de Nuits are Romanée Conti, Clos de Vougeot, Tâche Romanée, Chambertin, Musigny, Clos de Tart, Corton, and St Georges. The finest white Burgundies are found in much smaller quantities than the red in the communes of Montrachet and Meursault on the Côte de Beaune. More plentiful

and therefore better known in England are the white wines of Chablis outside the Côte d'Or in the Yonne dept. They are lighter than Montrachet and Meursault, and the best vineyards are Clos, Valmur, Vaudésir, Grenouilles, and Blanchot. The white Burgundies are dry wines. The Hospices de Beaune, alms-houses founded in 1443, depend for their revenue mainly on the sale of wines from the vineyards which have been bequeathed to them and the auction sale of their wines in Nov. may be said to fix the price of the Burgundy vintage. See S. Gwynn, *Burgundy*, 1934; M. R. Danguy, *Les Grands Vins de Bourgogne*, n.d.; H. Warner Allen, *Natural Red Wines*, 1951.

Burhanpur, tn in Madhya Pradesh, India, on the Tapti, close to the border of Bombay state. It was the cap. of the Deccan Prov. of the Mughal Empire from about AD 1596 to 1635.

Burhou, long, low is. lying W. of Alderney (q.v.), remarkable for its seabird life. There are two recently estab. gannetries.

Burial Acts. Burial is the ordinary mode of disposing of the body of a deceased person, but the Eng. law contains no prohibition of other methods, so that cremation was lawful even before the Cremation Act, 1902, was passed to regulate it. Nor does the law require burial in any particular place; nor, if elsewhere than in consecrated ground, is any particular ceremony prescribed; and burial in private ground is allowable provided such burial does not amount to a nuisance or infringe any statutory prohibition against burial in any particular locality. But all burials must be effected in a decent and orderly manner whether with or without a religious service; and disregard of this provision of the Burial Laws Amendment Act, 1880, is a misdemeanour. Under the Act of 1880 wilful obstruction of a burial or burial service, or the delivery of an address which is not part of the religious service permitted by the Act or by any lawful authority, is a misdemeanour. No one can by will or in any other way legally dispose of his body after death, and any such testamentary disposition may be ignored by his personal representatives; but he may effectively give directions regarding the anatomical examination of his body. In most pars. there is a burial-ground recognised as the par. churchyard, and this place constitutes the ordinary place of burial unless closed for burials by Order in Council, contravention of such order involving penalties under the Burial Act of 1855. There is no certainty as to what conditions constitute a par. churchyard, but consecration, whether actual or presumed, seems to be essential, and length of time during which use as a par. churchyard has prevailed is really the only conclusive evidence of a presumption apart from actual consecration. Every parishioner and inhab. of a par., and every person dying in the par., has the right to be buried in the par. churchyard or burial-ground, a right enforceable at common law as well as by

the eccles. court. The churchwardens and incumbent can, however, permit non-parishioners to be buried in their par. churchyards, subject to a possible injunction by the chancery div. if such interment amounts to actual inconvenience to the parishioners. The right of burial does not carry with it a right to have a monument erected nor a vault. Generally burial in an iron coffin will be regarded by the eccles. court as proper. Parishioners have no right to burial within the church. Burial in a church depends on the issue of a faculty in that behalf. Erecting a monument to the dead in a churchyard or church otherwise than under the authority of a faculty therefor is an offence cognisable by the eccles. court. Also, in the absence of a faculty, there is no exclusive right to the use of a particular part of the churchyard for burial purposes. By the eccles. canons it is the duty of every minister of the Church of England to perform the burial service over the body of any person not excluded from Christian burial, and otherwise entitled to burial in a churchyard; and refusal or failure to do so may entail suspension from his ministry and possibly an action for damages. Suicides, where a verdict of *felo de se* has been found, must be interred in the ordinary manner as if no such verdict had been returned; but the rites of Christian burial are not to be performed on interment, so that such burial may be without any religious service or with such ordinary Christian service other than that of the Church as the person having charge of the burial thinks fit. The common law allows no fee in respect of burial, but such fees may be due by immemorial custom or by statute. Fees alleged to be due by custom are commonly paid, and generally to the incumbent. Additional fees are paid for the erection of monuments or vaults. The Church Commissioners have power to fix tables of burial fees, and such tables must be registered in the diocesan registry. Burial-grounds are provided and maintained by burial boards and other authorities under the B. A., 1852 to 1906. The power of adopting these Acts for a poor law par. in an urb. dist. rests with the vestry, subject to the consent of the urb. authority, and the vestry can elect and control the burial board. Consent of urb. authorities is indispensable to the adoption of the B. A., and in some cases the sanction of the Ministry of Health is necessary. The burial board may also in some cases contract with cemetery owners, and the board has all necessary legal powers to acquire the requisite land. Urb. authorities, that is bor. councils and non-municipal urb. dist. councils, may exercise the functions of a burial board. In a rural par. the par. has exclusively the power to adopt the B. A. for the whole of the par. subject, if the par. is divided for eccles. purposes, to the consent of the Ministry of Health. In London, outside the city, the B. A. were declared by the London (Adoptive Acts) Scheme, 1900, to be in force in

certain metropolitan bors., while in the remaining bors. the Acts may be brought into force by Order in Council. The burial authorities for London are the metropolitan bor. councils, and in most cases they are not subject to the control of any vestry or similar body. The corporation of the City of London have the functions of a burial board for the city. Under the Public Health (Interments) Act, 1879, any urb. or rural dist. council may provide a cemetery and must if so required by the Ministry of Health. There are also statutory provisions for regularising the provision and maintenance of private cemeteries. These are usually owned by companies, who must provide for due registration of burials in the cemeteries owned by them. The powers of a burial authority to provide and maintain burial-grounds or cemeteries extend to and include the provision and maintenance of crematoria. *See also* CREMATION.

Burial Customs. From the earliest times customs and institutions have crystallised around the act of human sepulture, and in numerous instances these bear a striking similarity to one another, although widely separated by circumstances of time and geography. Many primitive peoples, for example, both prehistoric and modern, bury their dead in the foetal posture—that is, with knees drawn up to the chin, and placed upright in the grave dug to receive the body. Early burials in many countries bear traces of fire, and show that cremation after inhumation was resorted to. Later a rude effort at preservation of the corpse was attempted, as in prehistoric Egypt, where bitumen was smeared over the remains—the first attempt at mummification. In the evolution of B. C. we can distinctly trace various steps: eating of dead kindred, in order to partake of their virtues, pounded bones or ashes eaten by kinsmen, water in which the body was placed drunk by kinsmen, foetal burial, attempts at cremation, rude embalment, urn burial, aerial burial, inhumation in cists or stone coffins, modern sepulture. It is not advanced that these methods came into use one after another in any one sphere, but that this is an ideal course of their evolution culled from the mortuary customs of many lands and ages.

Europe. Palaeolithic burials are seldom encountered in Europe, and consisted chiefly in placing the remains in caves or similar retreats. It is very unlikely that any fixed custom attached to the disposal of remains until at least later Palaeolithic times. In Neolithic times foetal inhumation was probably customary, but in some centres cremation and burial in stone cists and urns prevailed. In later Neolithic times burial was in barrows or mounds. The long-skulled aborigines who preceded the Celts in Europe placing their dead in long barrows, whilst the Celts buried theirs in round barrows. Many of these barrows are honeycombed with graves, and yield rich results to the archaeologist, who usually discovers therein tools and weapons of the Bronze period. It was

customary for the early races of Europe, and indeed for primitive races all over the globe, to inter with their dead such articles as they considered would be necessary for their comfort in the world of shadows, and it is fortunate for modern archaeology that primitive graves have yielded these in abundance. Graves of the Bronze Age all over Europe bear a great resemblance to one another. In Greece and Rome cremation was resorted to. Burials of the early Christian period were usually made in catacombs, such as those at Rome, where the bodies were placed in niches in the walls, and their resting-places decorated with paintings and sculpture. Outside of the Roman sphere of influence burial in Europe retained its primitive character, the offering of objects to the *manes* of the deceased being almost universal. With the introduction of Christianity, however, sepulture in consecrated ground became and continues to be the rule among Christian people. (*See* BURIAL ACTS.) Propitiation of the *manes* of the deceased is seen in Europe in the custom which until comparatively recently obtained in Northumberland of sacrificing domestic animals prior to the burial of the dead, and even a trace of human sacrifice may be preserved in the custom at highland funerals of the friends of the dead person fighting until blood was drawn—an example of the substitution of the part for the whole. Even the practice of the eating of dead kindred is typified in parts of Britain by the custom of 'sin-eating,' in which a paid person devours a piece of bread and cheese or a cake and drinks a mug of ale over the coffin of the dead. Until the beginning of the 19th cent. the burial of a gipsy chief was often accompanied by the sacrifice of his horse, either as a propitiation to his spirit, or because it was regarded as essential to his comfort in the next world.

Asia. Burial in early Palestine appears to have been effected in caves and similar places, where the corpse would not be readily got at by beasts of prey. In Muslim countries inhumation in cemeteries is common, and the turban cut in stone, the symbol of the Muslim faith, is usually found upon the graves. In India the Parsees expose the dead on the summits of towers, where they are devoured by birds of prey. The splendid tombs of Hindustan are eloquent witnesses of the manner of disposing of the dead which obtained among those of the Brahman religion. In China, where ancestor worship is the national religion, a paper house is constructed for the soul of the departed about 10 ft high by 12 ft deep. This contains various apartments, and a paper image of the dead is placed inside it, with paper models of food and all necessities. The deceased is afterwards worshipped by his children. In China mourning materials are white. Throughout Asia customs of sepulture differ but in minor details, and in Japan, Burma, Korea, and the Mongolian peninsula consist of burial according to the rites of ceremonial Buddhism.

America. In America many of the customs alluded to as prevalent in prehistoric times are found. Thus interment in mounds and stone cists or caves is frequent, but tribal custom often dictates methods of sepulture which are strictly adhered to. Thus the Mohawks formerly made a large round hole in which the body was placed in a squatting posture, after which it was covered with timber and earth. Some Carolina tribes placed the corpse on a cane hurdle and deposited it in an outhouse for a day. It was then wrapped in cane matting or rushes and deposited in a grave, logs or stone slabs being placed over it so that the earth might not fall on the body. The Creeks and Seminoles of Florida generally buried their dead in a circular pit about 4 ft deep, the corpse with a blanket or cloth wrapped about it being placed in a sitting posture, the legs bent under and tied together. Wooden vaults are also sometimes found, as are dome-shaped stone vaults. Sometimes clay was spread over the corpse and fire applied before burial. Sometimes even mummification was practised. Aerial sepulture in trees and upon raised platforms, burial in lodges, in canoes and urns, are other Amer. modes of disposing of the dead. In S. America very similar methods are in vogue, the habit of scraping the bones and hanging them up in baskets in trees or at the doors of lodges being very common. Mummification was practised in anct. Peru.

Africa. The funerary customs of Egypt are too well known to require lengthy description. (See EMBALMING.) There were 3 modes of mummification, undertaken by a special caste who were abhorrent to the rest of the pop., namely: entire embalment; partial embalment; and a mere smearing over of the corpse with bitumen. The mummy was placed in a rock-cut tomb, surrounded with paintings representing objects supposed to be useful to it, and *ushobtiu* figurines which represented servants to attend to its requirements in Amenti or Hades. Most tribes of Africa, if cannibals, often devour the corpse or a portion of it, and if non-cannibal bury it. Some tribes, however, merely take the body into the bush or forest and leave it to be devoured by wild animals.

In Polynesia until recently it was customary to devour a dead relative in order that his virtues might enter the bodies of his descendants. Among the Eskimos burial by canoe is often practised: and in Australia the nomad tribes either leave the body to rot, or bury it in the ordinary manner. See Sir T. Browne, *Hydrotaphia, Urne Buriall*, 1658; V. Schulze, *De christianorum veterum rebus sepulchralibus*, 1879; J. Ferguson, *History of Indian and Eastern Architecture*, 1910; G. Quell, *Die Auffassung des Todes in Israel*, 1925; B. S. Puckle, *Funeral Customs*, 1928; E. Bendaun, *Death Customs: an Analytical Study of Burial Rites*, 1930; Sir J. G. Frazer, *Garnered Sheaves*, 1931; L. V. Grinsell, *Ancient Burial Mounds of England*, 1936.

Buridan, Jean (c. 1297–after 1368), Fr.

philosopher. A native of Artois, he studied under Wm of Occam in Paris, where he later became prof. of philosophy, and, in 1327, rector. Under an ordinance of Louis XI the reading of his works was prohibited. His philosophy is based upon the doctrines of his teacher Occam. His ideas in connection with free will, contained in his comments on Aristotle's *Ethics*, bear a resemblance to Locke's.

Burigny, Jean L'Évesque de (1692–1785), Fr. philosophical writer remarkable for his extraordinary versatility and the volume of his pub., as well as for his erudition. Among his works are *Histoire de la philosophie païenne*, 1724, biographies of Grotius and Erasmus, 1750 and 1757, a treatise on papal authority, 1720, and a *Histoire des révolutions de l'empire de Constantinople*, 1749. He was made member of the *Académie des inscriptions et belles-lettres* in 1750.

Burins, see CHISELS.

Buriti Palm, or *Mauritia vinifera*, is a handsome species of Palmaceae found in S. America, especially in Brazil. It is one of the loftiest of palms, growing to a height of 100 to 120 ft, and it yields many useful products. Among these are a pulp from the fruits which is converted into a sweetmeat, a juice which makes a delicious beverage, and leaf-fibre used for making mats.

Burkburnett, city in Wichita co., Texas, U.S.A., the centre of a large oilfield. Pop. 4600.

Burke, Edmund (1729–97), statesman, b. in Dublin, where his father was at this time practising as an attorney. His father was a Protestant, a faith in which Edmund himself was brought up; but his mother belonged to the Rom. Catholic faith, and this, together with the fact that his earliest schoolmaster belonged to the Society of Friends, possibly gave him the foundations of the toleration which he later applied to religious questions. In 1748 he graduated from Trinity College, Dublin, and 2 years later came to London to study law. In 1755 his attitude towards law and his desultory career so displeased his father that he stopped his allowance. B. therefore set himself to work to gain a living for himself. In 1756 his first pub. works appeared: *A Vindication of Natural Society*, a satire on the views of Bolingbroke, and *Philosophical Inquiry into the Origin of our Ideas on the Sublime and the Beautiful*. In the same year B. married Jane Nugent. They had 2 sons: Richard, b. in 1758, and Christopher, who d. in infancy. B.'s mind was now turning from abstract speculation to the solution of the political and economic problems of the time. His *Abridgment of the History of England* was partially printed during 1757, but was not pub. in full until after his death. In 1758, when the events of the Seven Years War were just beginning to turn in England's favour, B. put forward the idea of the *Annual Register*, a pub. which was to give a review of the chief events and movements of the year. The first vol. of this work appeared in 1759, and B.'s active

connection with the pub. continued until 1788, and probably even after that date he had much to do with it. He gradually came to be well known in society, and in 1765 he was appointed private secretary to the Marquess of Rockingham, who had just been made Prime Minister. In 1765 he was returned to Parliament for Wendover, and in Jan. of the following year, 1766, he took his seat and began his career as an active politician. He spoke on the Amer. question and against his party when he made his maiden speech about a fortnight later. He speedily gained for himself a reputation as a parl. speaker, and although his voice was harsh and his actions awkward, he became one of the



EDMUND BURKE

An engraving after a painting by Sir Joshua Reynolds.

most eloquent and powerful speakers in the House. In 1766 the Rockingham ministry was overthrown, and B. spent a short time in Ireland. On his return he was offered a post in the administration which the Earl of Chatham was forming, but declined to leave his old leader, and became during the session one of the leading members of the opposition. In 1769 he pub. *Observations on a late Publication on the Present State of the Nation*, and made a brilliant criticism of the policy of Grenville. He was much absorbed during the year with questions which touched the constitution, and was against the policy which the House adopted towards the Wilkes v. Luttrell election. In 1770 appeared his famous *Thoughts on the Present Discontents*, in which he attacked the existing system of gov., with its basis in court patronage. He criticised the policy of the House towards the printing of reports of the proceedings, and was himself bitterly attacked, being without the slightest foundation charged with the authorship of the *Letters of Junius*. In 1774 began the famous

alliance between B. and Charles James Fox (q.v.), who, a youth of 25 at this time, had been won over by the influence of B., and always regarded him as his political master. From 1774 until the outbreak of war in 1775 he was continually striving for conciliation with the Amer. colonies. He was elected member for Bristol in this year, and introduced his famous resolutions for conciliation. The next few years were occupied with plans for economic reform and with pleadings for Catholic relief. His known advocacy of Catholic relief measures roused the anger of the people of London; nevertheless in 1781 he was re-elected to the Commons as M.P. for Malton. On the formation of the next Rockingham ministry he was not given Cabinet rank, but he became paymaster of the forces, an office which he tried to reform. In 1782 he lost his friend and leader Rockingham. The Shelburne administration was overthrown by the unnatural coalition of North and Fox, a coalition which B. approved. He accepted again the office of paymaster of the forces under the Portland ministry and gave his attention to the question of India, he being to a great extent responsible for the drawing up of Fox's India Bill. The accession of Pitt to power threw great obstacles in his way, but he determined to bring Hastings to justice for his alleged misdeeds. At first his chance of success seemed small, but the opposition took the question up, and ultimately the impeachment moved by Fox was accepted by Pitt. In 1788 he began his famous speech on the impeachment, a speech which he concluded with a brilliant peroration; and his efforts only ended with Hastings's acquittal in 1795. In 1789, on the outbreak of the Fr. Revolution, B. was asked his ideas on the subject. His answer was practically the *Reflections on the Revolution*, a book which saw nothing but evil in the outbreak of a disordered mob against the rule of law and order. The attack of the 'swinish multitude' could not be reconciled with his love of order, in which alone he saw liberty. His book created a great stir; it gave rise to at least 2 famous replies: *The Rights of Man* (Paine) and *Vindiciæ Gallicæ* (Mackintosh). It called forth the congratulations of the kingdom, of the king, and of many of the sovereigns of Europe. But the Fr. Revolution put an end to B.'s love of toleration; henceforth in projected reform he saw only revolution, and he even opposed the repeal of the Test and Corporation Acts. His opinions on the revolution, so widely different from those of his friend Fox, led to the withdrawal of B. from the party he had so long supported, and to a breach of his friendship with Fox. After his retirement from his party he set himself to lead Whig thought back to the principles of 1688, and pub. his *Appeal from the New to the Old Whigs*. He took little part in parl. life during the next session, and when he did, opposed toleration. During the remaining years he continued to criticise what he conceived to be the principles of the revolution. In 1795 the impeachment of

Hastings ended, and in July of that year B. retired from Parliament. His retirement was made easier for him by the grant of a pension, but the death of his only surviving son just after his election to Parliament in succession to his father broke his heart, and he retired to Beaconsfield, a shattered man. In 1796 he began the pub. of the *Letters on a Regicide Peace*, but they were greatly delayed owing to his frequent and increasing illness, and he d. the following year. Though his political influence was enormous in his own day, B. is perhaps best remembered for his fine prose-writing, which has rarely been equalled. See Viscount Morley, *Edmund Burke, an Historical Study*, 1893; J. McCunn, *Political Philosophy of Burke*, 1913; Sir H. J. C. Grierson, 'Edmund Burke,' in *Cambridge History of English Literature*, vol. xi, 1914; B. Newman, *Edmund Burke*, 1927; D. C. Bryant, *Edmund Burke and his Literary Friends*, 1939; E. E. Reynolds, *Edmund Burke: Christian Statesman*, 1948.

Burke, Sir John Bernard (1814-92). Brit. genealogist; b. in London, he received his education there and in France. His father, John B. (1787-1818), instituted the work which has since been pub. at intervals, called *Burke's Peerage*, besides compiling an *Encyclopaedia of Heraldry*. B. himself was appointed Ulster king-of-arms in 1853, and was knighted in the following year. He ed. *Burke's Peerage* till his death, besides producing, among other works, *Anecdotes of the Aristocracy*, 1849, *Vicissitudes of Families*, 1859-63, and *The Book of Precedence*, 1881.

Burke, Kenneth (1897-). Amer. literary critic. b. Pittsburgh. Educ. at Ohio State Univ. and Columbia, he was music critic of the *Dial* from 1927 to 1929, and of the *Nation* from 1934 to 1936. In 1928 he won the *Dial* award of \$2000 for distinguished service to Amer. literature, and in 1950 he was visiting prof. of English at Chicago. His works on the psychology of literary criticism are of such an advanced type that he has been called 'the critics' critic.' Among his books are *Permanence and Change*, 1935, *Attitudes Towards History*, 1937, *The Philosophy of Literary Form*, 1941, *A Grammar of Motives*, 1945, and *A Rhetoric of Motives*, 1950.

Burke, Robert O'Hara (1820-61), explorer of Australia. A native of Ireland, he was educ. in Belgium, and became at the age of 20 a captain in the Austrian Army. He joined the Royal Irish Constabulary in 1848, and in 1853 he sailed to Melbourne, where he became a member of the police. He led an expedition into the interior of Australia in 1860, which ended tragically. Dissensions caused fatal delays to an expected relief party, and B., with Wills and Gray, 2 of his companions, perished miserably, only one man, King, surviving to tell the tale.

Burke, Thomas (1886-1945), novelist and descriptive writer, b. London. Left an orphan at an early age, he worked in an office, then in a second-hand bookshop, and after that for a literary agent. He first appeared in print when he was 16, and

eventually became known as the supreme interpreter of London's East End and Chinatown. His descriptive works include *Nights in Town*, 1915, *Out and About*, 1919, *The Outer Circle*, 1921, *The London Spy*, 1922, *The Real East End*, 1932, and *London in My Times*, 1934. He was equally successful as a writer of short stories, collections of which are *Limehouse Nights*, 1916, *Whispering Windows*, 1920, and *The Pleasantries of Old Quong*, 1931. He also pub. sev. books of verse, including *Pavements and Pastures*, 1912, and *London Lamps*, 1917. Among his novels are *Murder at Elstree*, 1936, *Abduction*, 1939, and the autobiographical *Wind and the Rain*, 1924.

Burke, William (1792-1829), Irish criminal. Failure in a variety of trades led to his adoption of body-snatching as a livelihood. In co-operation with a man Hare, a lodging-house keeper, he sold the body of a fellow loafer to Dr Robert Knox of Edinburgh for £7 10s. This was his first attempt. Later the 2 men perpetrated a series of murders by means of suffocation, afterwards disposing of the bodies to anatomists, chief among them being Dr Knox. By the time the sixteenth murder had been committed suspicion culminated in their arrest, and on queen's evidence from Hare, B. was hanged in 1829. The slang term 'to burke' signifies the process of suffocation skillfully arranged to leave no signs of violence, and hence to suppress quietly. See W. Roughhead, *Burke and Hare*, 1948, and Dylan Thomas, *The Doctor and the Devils*, 1953.

Burke's Peerage, see under **DURKE, SIR JOHN BERNARD** AND **PRECEDENCE**.

Burkhan-Budda Mountains, range of the Kuen-lun system, Tibet, which is largely composed of schists and Archaean crystalline rocks, with Palaeozoic sediments. It runs in a WNW. to ESE. direction, keeping between 96° and 98° E. The average elevation is over 16,000 ft., whilst Prychevalski has an altitude of 17,000 ft.

Burkhard, Willy (1900-55), Swiss composer, studied at Bern, Munich, and Paris. From 1928 he taught at the Conservatoire of Bern and from 1942, after sev. years' retirement for his health, at that of Zürich. His numerous works include the opera *Die schwarze Spinne* (after Gottlieb); choral music, including the oratorios *Das Gesicht Jesajas* and *Das Jahr*; 2 symphonies and other orchestral works; sev. concertos; chamber, pianoforte, and organ music; songs, etc.

Burkitt, William (1650-1703), parson and commentator, b. Suffolk; educ. at Stowmarket and Cambridge grammar schools and at Pembroke Hall. After leaving the univ. he became chaplain of Biddston Hall; later (c. 1672), rector at Milden; in 1692 vicar of Dedham, Essex; preached against Baptists, 1691; showed Fr. Protestant exiles, 1687-92, and showed great zeal for foreign missions. Among his works are *Argumentative and Practical Discourse on Infant Baptism* (reprinted 1722), *Poor Man's Help and Young Man's Guide* (32nd ed. *Help and Guide to*

Chris an Families, 1764), *Explanatory Notes on the Four Evangelists, Expository Notes on New Testament*. His works were frequently reprinted and abridged. See Parkhurst's life, 1704; Calamy, *Account*, 1713; Palmer, *Nonconformist Memorial*, 1803.

Burlamaqui, Jean Jacques (1694–1748), Swiss writer on natural law. After travelling in France and England, he became prof. of law, and later, when his health gave way, member of the council of state at Geneva. His belief in a rational utilitarianism is expressed in the lucid, unaffected writing of his *Principes du droit naturel*, 1747, and his *Principes du droit politique*, 1751.

Burleigh, Bennet (c. 1840–1914), Brit. war correspondent, was on the staff of the *Daily Telegraph* from 1882. His early years are wrapped in mystery. He was probably b. in Scotland, for he said he left school in Glasgow during the Amer. Civil War, in which he fought for the Confederates and was twice sentenced to death. Throughout the Egyptian war he was at the front, at first as the *Central News* correspondent, and then as the representative of the *Daily Telegraph*. Besides accompanying the desert column in 1884, he went on the Ashanti and Atbara expeditions. Finally he was at the front during the S. African, Somali, Russo-Jap., and Balkan wars. Thus in his various pubs. he was able to draw on a wide experience, the best of these being *On the Road to Omdurman*, 1898.

Burleigh, or Burghley, William Cecil, 1st Baron (1520–98), statesman, b. Bourne, in Lincs, the eldest son of Richard Cecil, a rich squire of Burghley, Northants. He was educ. at St John's College, Cambridge, where he met Roger Ascham and John Cheke. At the age of 21 he married Cheke's sister, by whom he had Thomas, an only child, the future Earl of Exeter. In 1544 Mary Cheke d., and he married in 1545 a daughter of Sir Anthony Cooke. About 1548 B. became private secretary to Somerset, and was sent to the Tower in 1549 by order of Somerset's opponents, but in Jan. of the following year was released upon oath. He subsequently won his way back to favour and in 1551 he was knighted. During Mary's reign B. outwardly conformed to Catholicism, but even before Mary's death he had estab. an intimate understanding with the Princess Elizabeth, and had gained her complete confidence. On her accession, Elizabeth made him her secretary of state: from 1572 he was lord high treasurer. He was created baron B. in 1571.

B.'s influence on Elizabethan policy was enormous, but was probably never greater than during the first 10 years of Elizabeth's reign. He worked in the queen's service, loyally attempting to maintain financial stability at home, and to strengthen England's external position by supporting Protestant movements in Scotland, France, and the Low Countries, a policy in which he did not always have Elizabeth's full support. B. is notable as the superb administrator of Elizabethan England; but it seems clear that though

he had the queen's absolute confidence, he never dominated her, though his influence probably persuaded her to take a more positively Protestant line on occasion—purely on grounds of political expediency—than she might otherwise have done. See F. P. Burnard, *William Cecil, Lord Burghley*, 1904, and C. Read, *Mr Secretary Cecil and Queen Elizabeth*, 1955.

Burlesque (from It. *burla*, a jest) is applied to writing, acting, speaking, and to drawing, where it is more often called 'caricature.' It consists in distorting or exaggerating a work of art, the object being to excite ridicule. Thus it throws into strong relief peculiarities and affectations and lays stress on all incongruities and oddities, and since it is not malicious, as satire often is, it is used to expose bombast and insincere rhetoric, sham virtues, and all hypocrisies. Above all, it loves to rouse laughter by discord between subject and style, to make 'gods speak like common men, and common men like gods.' Thus all mock-heroic poetry, such as Butler's inimitable *Hudibras*, Pope's *Rape of the Lock*, and many of the smaller poems of Gray and Cowper, where rabbits and birds and cats are endowed with the sense—and folly—of human beings, are also B.s. What may be styled 'animal' B.s. have been popular from the time of Chaucer; indeed his *Nun's Priest's Tale*, where Chauntecleer, the cock, and Pertelote, his wife, discuss the value of ominous dreams after the manner of Gk sages, has never been surpassed. Most people would agree in giving to Aristophanes the highest place among B. writers. Even to-day the splendid fun of his representations of Socrates up in a balloon studying the heavens, or of the demagogue Cleon as a sausage-seller, can be appreciated by every classical student, and how much more monstrous must the B. have appeared to the actual contemporaries of Socrates and Cleon, who could enjoy at once the piquancy of many an allusion lost to-day. The It. word originates in the *Opere burlesche* of Berni, 1497–1535. In France Scarron made a clever mock imitation in his *Virgile travesti*, 1648–53, and throughout Louis XIV's reign travesties of the epics of antiquity were fashionable. In *Don Quixote* the ideals of chivalry are ludicrously misrepresented through the adventures of Don Quixote, the enthusiast, and Sancho Panza, the apostle of common sense, whilst Chaucer, in his *Rime of Sir Thopas*, gently scoffs at the interminable and tiresome romances of his day, and Racine, in his one comedy, *Les Plaideurs*, burlesques judicial ineptitude. Buckingham's *Rehearsal*, Gay's *Beggar's Opera*, Fielding's *Joseph Andrews*, G. B. Shaw's *Androcles and the Lion*, and the operas of Gilbert and Sullivan, may also be cited as illustrations of B.

Burlingame, Anson (1820–70), Amer. diplomat. He was a native of New Berlin, New York. He graduated at the Harvard Law School in 1846, and subsequently practised successfully at Boston. His speeches in support of the Free Soil

party (q.v.) attracted considerable attention. He was a member of the Massachusetts Senate, 1853-4, and of the U.S. House of Representatives, 1855-61. His advocacy of Hungary's independence evoked a hostile Austrian attitude to his appointment as minister at Vienna. He was transferred to China by Lincoln as a result. His activities produced the 'B.' treaty, in which China's right of dominion over all her ter. was acknowledged.

Burlington, Earls of, see BOYLE, RICHARD.

Burlington (Yorks), see BRIDLINGTON.

Burlington: 1. City of New Jersey, U.S.A. It is situated on the Delaware R., 18 m. N.E. of Philadelphia. Its pop. is 12,050. It manufs. silk, textiles, shoes, metal products, canned goods, and type-writer ribbons, and is the shipping centre for an agric. region. It has St Mary's Church (1703); the first colonial money was printed here by Benjamin Franklin (1726); the first New Jersey newspaper was printed here (1777). James Fenimore Cooper was b. here. The B. Society library, estab. 1757, is one of the oldest in America, and the town owes its settlement to Eng. Quakers, in 1677.

2. City of Chittenden co., Vermont, U.S.A. It is placed on the E. coast of Lake Champlain, and is the largest tn in the state. Its pop. is 33,155. Its situation gives it popularity as a summer resort. Its manufs. include maple sugar and other food products, textiles, wood and metal products, tools, electrical machinery, and brush fibres; it also has printing and granite and talc quarries, and it is a shipping centre and port of entry. B. is the seat of the univ. of Vermont and Trinity College. There is a Rom. Catholic cathedral, and the grave of Ethan Allen is here.

3. City and riv. port, cap. of Des Moines co., Iowa, U.S.A., on Mississippi R. (bridged), 150 m. ESE. of Des Moines, with railway shops and ironworks. Varied manufs. include baskets, desks, caskets, harvest combines, fertilisers, and soap. The ann. Tri-State Fair is held here. Pop. 30,600.

4. City in Alamance co., N. Carolina, U.S.A. It has important manufs. of hosiery and textiles, and is a weaving, dyeing, and finishing centre. It also manufs. radio parts, foundry products, coffins, and paper boxes, and there are lumber mills and tobacco warehouses. Pop. 24,560.

Burlington House was built on the N. side of Piccadilly, 1665-8. In 1854 the Gov. paid £140,000 for the old house, which Richard Boyle, Earl of Burlington, had built. The Royal Academy acquired a lease of it and of a garden behind in 1867, and 2 years later opened exhibition galleries and schools over the garden site. The new building in the It. Renaissance style, erected 1869-72, now provides accommodation for the examining body of London Univ., and for the following societies: Royal, Astronomical, Antiquarian, Linnean, Geological, and Chemical. The Gibson statuary and diploma works are stored in the upper

storey, whilst the Royal Academy holds its ann. exhibition and banquet here in premises consisting of 13 halls, a theatre, and a central octagon, the total cost of which was £150,000.

Burlus Lake, shallow lagoon, 38 m. long, in the N. of the delta of the Nile, Egypt, with which it is connected by canals. One channel also connects it with the Mediterranean.

Burma, Union of, independent rep. in SE. Asia, made up of the 5 constituent states of Kachin, Shan, Kayah, Karen, the Special Div. of the Chins, and B. proper, comprising the 7 divs. of Mandalay, Sagaing, Magwo, Arakan, Tenasserim, Pegu, and Irawadi. Roughly 1200 m. from N. to S. and 575 m. at its broadest from E. to W., B. is bounded on the N. by Tibet, on the E. by China, Laos, and Thailand, on the S. by Thailand and the Andaman Sea, and on the W. by the Bay of Bengal, E. Pakistan, and India (Assam). The coastline of B. is 1200 m., from the Naaf estuary near the borders of E. Pakistan to Victoria Point in the S.

Topography. Physically, the area comprises ranges of hills which are in the form of a horseshoe running from the Arakan Yomas and the W. Hills N. to the mts bordering Tibet and Yunnan, and S. to the Shan Plateau and the hills of the Tenasserim. The valleys of the rivs. Irawadi and Sittang nestle within it, separated by the hills called the Pegu Yomas. The Arakan and Tenasserim regions are maritime coastal strips. Most of the area is therefore hilly and rugged with mts in places rising to 12,000-15,000 ft, especially in the Patkoi Range (in the W. Hills region), and in the N. Kachin State area close to the borders of Tibet and China. The chief riv. is the Irawadi, whose source is formed by the Mekha and Malekha Rs which flow down from the mts of Tibet. The Irawadi flows for over 1000 m. down to the Bay of Bengal. It is navigable for the whole year as far as Bhamo, 900 m. from the sea. Its main trib., the Chindwin, is navigable up to Homalin, about 300 m. from the confluence of the 2 rivs. The Irawadi flows through the most fertile parts of B. and is the country's main highway. The 2 other main rivs., the Salween and the Sittang, are navigable only for short distances from their estuaries, but locally by small riv. craft. The rivs. and streams of B. are important communication routes, and numerous craft, large and small, motor and other, ply on every navigable stretch of water. The unnavigable rivs. and streams, notably the Sittang and Salween Rs, are also put to good use as timber chutes, the logs from the valuable forests further upstream being floated down to be collected at the important milling centres. Hydro-electric schemes have also been planned, and some of them are in process of execution. The waters of the rivs. rise during the rainy season, the banks being flooded to a distance of sev. m. on the Irawadi. Most of the houses in the vils. along the riv. are therefore built on stilts, and for sev.

months in the year some of these vils. are completely isolated except from access by riv. craft.

Climate. The climate and rainfall vary considerably in different parts of the country, the rainfall ranging from over 200 in. mean yearly rainfall in N. Arakan and N. Tonassorim to less than 30 in. in the 'Dry Zone' of Central B. Most of the rain falls during the rainy season (from mid May to mid Oct.), when the SW. monsoon blows, bringing the rain clouds. There are 3 seasons, the rainy, the hot, and the cool. During the hot season (Feb.-May), the temp. rises to about 100° F. in the delta, of the Irawadi, and temps. of 104-105° F. have been recorded in the Mandalay area, which is in the centre of the 'Dry Zone.' During the cool season (from Nov. to the end of Jan.) the temp. in the plains of S. B. falls to within 60° and 70°, and in Central B. to less than 60°. It is cooler throughout the years in the hilly regions.

Agriculture and forestry. B. is essentially an agric. country, and the main single commodity exported is rice. One of the largest producers and exporters of rice in the world, B. exported in 1955-6 about 1.9 million tons of rice, the total acreage under rice being 10,400,000 ac. The main rice-producing area is the Irawadi delta with 6,500,000 ac. under rice, the climate, rainfall, and soil being very favourable for this crop. The main source of income of the country, the storage and export of rice, is controlled and operated by the gov. The second most important commodity exported is timber, mainly teak, 57,000 tons being exported in 1956. 145,000 sq. m. of Burma's total land area of 261,760 sq. m., (or 57 per cent) are covered by forests which produce valuable timber and other products. Of the various types of forests the most important is the mixed deciduous forest, which is at its best along the Pegu Yoma and in the Mu valley of Upper B. These forests contain the timbers of primary importance—teak (*Tectona grandis*), the world's finest general utility timber, pyinkado (*Xylia dolabriformis*), padauk (*Pterocarpus macrocarpus*), which are the source of much the greater part of the forest revenue of the country. Teak trees here are seen sometimes with a girth of 25 ft and a height of 120 ft from the ground to the lowest branch. In all the qualities that distinguish a good timber—resistance to shock, strength as a beam, weight, freedom from movement—it compares favourably with any of the generally accepted best timbers of the world, though in one particular quality, resistance to shock, it has to give way to ash and hickory and to one Burmese timber, yom (*Anogeissus*) (see also TEAK). Next to teak, pyinkado is probably of the next importance in the royalty it pays to the gov. and is of great value as being an extremely heavy and strong timber for railway sleepers and other heavy construction. It is a beautiful tree with a reddish flaky bark and shiny leaves rather like large pea leaves and a flower like an acacia. The tree flowers in the hot

weather and emits an agreeable smell. Padauk is a tree whose wood is used for gun-carriages. It has very sweet-scented little orange flowers. Kanyin, one of the big dipterocarps (*Dipterocarpus datus*), is a very fine tree, with a good timber known as gurjan. Thitya (*Shorea obtusa*), ingyin (*Pentacme suavis*), tankkyan (*Terminalia tomentosa*), pyinma (*Lagerstroemia flos-reginae*) are all timbers of importance not only to the country but to the world. There is in certain places a potentially most important type of forest not mentioned above—the practically pure bamboo forest of the Arakan Yoma. The importance of the bamboo (*Melocanna bambusoides*), called by the Burmese *wa*, arises from the fact that its non-clumping habit of growth has prevented the successful estab. of any tree species over many hundreds of sq. m. in Arakan and thereby formed very large areas of pure bamboo forest, potentially a source of great quantities of paper pulp. There are also many sq. m. of *Dipterocarpus tuberculatus* forest, corresponding closely to the sal forests of India. The timber is called in Burmese, and is usually conjoined with that of another dipterocarp, kanyin. This latter species is extremely resistant to the teredo or marine borer, and is therefore of great use when treated for the purpose of wharf piling. Another type of forest peculiar to B. is the indaing or deciduous dipterocarp forest, normally found in lateritic and sandy soils and seen at its best in the country N. of Mandalay and E. of the Irawadi around the mouth of the Shweli R. (see address by D. J. Atkinson, 'Forests and Forestry in Burma,' *Journal of the Royal Society of Arts*, 2 July 1948). The different forest products also include oils, varnish, tannin, gums, and rubber. The teak of the forests is controlled by the State, which pays much attention to the scientific culture of this valuable tree. The area of reserved forestry is over 34,687 sq. m.

Fauna. The wild animals of B. include the elephant, rhinoceros, tapir, buffalo, bison, deer, hog, cat, tiger, leopard, and bear. Pythons and cobras are found in great numbers, while that deadliest of B. reptiles, the hamadryad, is occasionally encountered. An extraordinary profusion of beautiful and varied birds forms a striking feature of the country, and an equal richness marks the fish supply. In the caves of the Mergui Archipelago are procured the edible birds' nests which form one of the delicacies of Chinese diet, while turtle eggs are also collected.

Minerals. The mineral deposits of B. comprise gold in riv. sand in small quantities (silver is found in the Shan States, but production is at present curtailed); tungsten ore; iron, copper, and lead, tin in the Mergui dist. in S. Tenasserim; petroleum by the Irawadi. Jade and amber are also worked, though the former is the more successful; good white marble is quarried at Mandalay, where it is used in the ornaments of Buddhist temples; coal is mined at places in Upper B., especially at Lalewa on the R. Chindwin,

limestone is procurable, and is burned in large quantities. At Mogok the finest rubies in the world are found.

Communications. There are 13,000 m. of motorable road and 2700 m. of railway; new constructions are being carried out. The Union of B. Airways also maintain regular internal service to over 30 tns in various parts of B. in addition to external services.

Population. There are many different races in B., but the main races are the Burmese (including the Arakanese), the Chins, Karens, Kachins, Kayahs, Mons, and Shans; of these the Burmese are the most numerous, numbering about 14 million. The people are of Mongoloid stock and are allied to the other races of E. Asia. The pop. of B. was about 19 million in 1953. Out of these, it is estimated that 75 per cent are engaged in agriculture, the crops grown, besides rice, being tobacco, millet, cotton, sesame, and ground-nuts. The cap. is Rangoon, a city of 737,000 souls (1953), and the second city is Mandalay with 201,000, (1953).

Religion. The majority of the people of B. are Buddhists of the Theravada or Hinaya School, the form of religion also shared by the people of Ceylon, Thailand, Cambodia, and Laos. Buddhism (*see* BUDDHA AND BUDDHISM) has a very great influence on the everyday life of the people, and B. can be said to be one of the main seats of Buddhist studies and learning in the world. There are also many Muslims, Christians, and Hindus among the citizens of B. In May 1954 the sixth Buddhist Council or Synod was convened near Rangoon. (The fifth Council was also held in B. at Mandalay in 1870, by King Mindon.) Leading Buddhists from many countries attended it.

Education. In education, B. compares favourably with the other countries of the E. The rate of literacy is about 60 per cent and there were 10,861 state schools with a total number of 1·8 million pupils in 1956, besides the numerous private schools and the monastic schools which had formerly been the mainstays of education in the old days, and which are still an important factor. For higher education there are the following institutions: the univ. of Rangoon with an ann. enrolment of over 7000 students a year; the Univ. College, Mandalay, a degree college with about 2000 students, the Intermediate colleges of Moulmein, Kyaukpau, Magwe, Yankin, and Hteedan, the last two being in Rangoon; the Engineering College, Rangoon; the State Technical Institute, Insein; State Technical Institute, Mandalay; State Teachers' Training Colleges and Institutes at Rangoon, Mandalay, Moulmein, Meiktila, and Kyaukpau; and the Univ. for Adult Education at Rangoon. There is also the Mass Education Scheme. Besides these, there are the Forest School at Maymye, the Veterinary School, Insein, the Agriculture College, Mandalay, and other vocational training schools. There are medical faculties at the univ. of Rangoon and the Univ. College, Mandalay. In the cultural

sphere, there are the State schools of Music and Drama, Rangoon, Fine Arts, Rangoon, and the Fine Arts, Music, and Drama, Mandalay.

Position of women. Burmese women have a unique position among the women of the E., and indeed of the world. Totally emancipated by anct tradition, they have enjoyed equal rights under customary law and suffrage is universal. Women participate in public affairs, and can be found in all the professions and the armed forces.

History. The original inhab. of B. are believed to have been of Austro-Asiatic stock, displaced by successive migrations from Central Asia. The Pyus, of Tibeto-Burman stock, early occupied the country with centres at Sriksetra (Old Promo) and Halingyi. Some of their writings date from the 7th cent. AD. The Mons, who are believed to have come down from Central Asia, founded the kingdom of Dvarvati in the Menam valley. In the 7th cent. AD the Mons of the Irawadi valley and Tenasserim came under the sway of that kingdom. There was also the Mon kingdom of Thulun in Lower B. The Burmans came to B. probably from the Kansu area. They entered B. through the N'mai-Kha and the Salween about the 9th cent. AD and settled in the Kyaukse area. The Chins, Kachins, and Karens probably entered B. at about the same time as the Burmans. The Shans, who belonged to the Tai family, arrived between the 11th and 13th cents. They came from the Tai kingdom of Nanchao in modern Yunnan. The movement S. was accelerated by the conquest of Nanchao by Kublai Khan in 1253.

At first B. was parcelled out into a number of small principalities. Anawrahta (1044?-1077?) unified B. politically by conquering the Mon kingdom of Thulun. His cap. was at Pagan. The Mon language and culture was adopted and was gradually replaced by Burmese, starting from the last quarter of the 12th cent. Hinayana Buddhism was introduced and Pagan became a religious centre with its numerous beautiful and imposing shrines, many of which are still in perfect condition to-day. The kingdom of Pagan lasted until 1287, when the cap. was sacked by the Mongols. The country once again broke up into small states with the N. ones owing some sort of allegiance to the Mongols.

The whole of N. and Central B. was parcelled out into small principalities ruled by the great Shan chiefs who were frequently at war with one another. In the S., B. was broken up into small Mon kingdoms also at war with one another and with the Shans in the N. This confused state of affairs ended in the latter part of the 14th cent. with the coming into power of 2 main states, one in N. B. with the cap. at Ava, and the other in S. B. with the cap. at Pegu. Razadarit, King of Pegu, who ascended the throne in 1385, tried to unify the country again but without success, and a series of civil wars broke out lasting for a cent. or so. This troubled period is notable for the

great upsurge of Burmese literature. The end of the 13th cent. saw the birth of Burmese literature, in both prose and poetry, and from that time onwards literature developed continuously. Meanwhile, events leading up to the reunification of the country were developing in the small vassal state of Toungoo, which owed allegiance to Ava. The position of Toungoo had been strengthened by the influx of refugees due to the civil wars, and the Lord of Toungoo, Min-Gyi-Nyo, who reigned from 1485 to 1530? conceived the ambition of once again reuniting the whole of B. As he died before accomplishing anything, his task fell to his son Tabinshwehti and later Bayinnaung. B. was united for 200 years under the Toungoo dynasty with the cap. at Pegu and later Ava, until 1740. During this period the kings fought wars with Siam, and sent an expeditionary force into Laos. The period produced many historic characters such as Tabinshwehti, Bayinnaung, whose career has been described as 'the greatest explosion of human energy ever seen in Burma,' Anaukpetlun, Thahun, and Natshinnaung, one of the greatest poets in the hist. of Burmese literature, etc. In the 16th cent. there were a number of Portuguese adventurers in B. One of them was Philip de Briton y Nocote, who attempted to gain control of Syriam and hold it as a Portuguese colony. He failed. His followers were sent up country and settled in vils. between the Chindwin and the Mu rivs. These descendants of de Brito's followers still form a devout Catholic community and live peaceful, quiet lives. The Toungoo dynasty came to an end in 1752, the country having been in turmoil since 1740 due to the degeneration of the last few kings of the dynasty. Alaungpaya, who restored order in the country, was an unimportant official administering a few vils. in the Shwebo area. He was the founder of the Konbaung dynasty which ruled B. from 1752 to 1885, when the British occupied the whole of B., Burmese power rose to its zenith under this dynasty, this being demonstrated by the defeat of the Chinese armies which invaded B. between the years 1765 and 1769. The outbreak of the Sino-Burmese war was due to sev. border incidents and resulted in the imperial armies taking the field on 4 main expeditions. Greatly outnumbered, the Burmese armies resorted to well planned and co-ordinated outflanking tactics, cutting and harassing the Chinese lines of communication while confronting the Chinese vanguard with thoroughly prepared defensive positions. This resulted in the complete rout of all 4 Chinese forces. Many thousands of the Chinese were killed or taken prisoner. A treaty of peace was signed in 1770 at Kaungton, providing for the resumption of trade between the 2 countries and the exchange of decennial missions between the 2 caps. The friendly relations between the 2 countries have never been seriously broken since that time. The Konbaung period also saw the invasion of Siam by the kings of B. on 4 occasions,

once successfully and thrice unsuccessfully, the last being in 1785 by Bodawpaya. This king was also responsible for casting the biggest bell in the world, which stands at Mingun, near Mandalay, and also for what is described as 'the biggest pile of bricks in the world' in the shape of the Mingun Pagoda, which, though unfinished (a third of its height only), is of gigantic proportions.

The English and Dutch had traded with B. since the 17th cent. The French came into the field in the 18th cent. With the power of the British growing in India and the expansion of Burmese frontiers under the Konbaung dynasty, conflict between the two was inevitable. War broke out in 1824 in the reign of Bagyidaw. Sev. border incidents led to the declaration of war by the Gov. of India on 5 Mar. 1824, and while Bandula, the famous Burmese general, was occupied on the B.-Bengal frontier, the British invaded Lower B. by sea, occupying Rangoon on 11 May 1824. Bandula was hastily recalled to the Rangoon front, but the Burmese troops, not even half of whom were armed with muskets, and who were supported by ancient field pieces, were no match against the superior Brit. arms, and in Dec. 1824 the Burmese had to retreat to Danabyu on the I. Irawadi, where new defensive positions were prepared. The initial advance of the British was repulsed. On 1 April 1825 Bandula was killed when the British began to bombard the Burmese positions. The war ended, with the treaty of Yandabo, which was ratified on 24 Feb. 1826. Arakan and Tenasserim were ceded to the British and B. had to pay an indemnity equivalent to a million sterling. From 1837 onwards, when Tharrawaddy seized the throne, the gov. of B. deteriorated and local officers could do as they pleased. Lord Dalhousie, the Governor-General of India, had embarked on a career of conquest and he held that a war with B. was 'inevitable.' The extortions of the Governor of Rangoon finally gave the British a pretext for war with B. War broke out in 1852. During the war there was a revolution in Ava, and Mindon, one of the best of B.'s kings, came to power. At the end of the war in May 1853 Lower B. was added to the Brit. Empire. Then there was a long period of peace. With the accession of Thibaw in 1875 the situation in B. deteriorated gradually, until in 1885 it was annexed and added to the Brit. Empire. But it was some years before Upper B. could be pacified.

During the First World War there were instances of unrest, and even rebellion, but disaffection never became general and was comparatively easily suppressed. B. contributed generously towards war expenses, on the other hand, and a large number of men enlisted for service in the army and labour corps. A revolt, nationalistic and economic in origin, broke out in 1930 in Lower B. and spread the following year to Upper B., but was suppressed by some 9000 Brit. and Indian troops and police. In 1923 B. had been constituted a governor's prov. of Brit. India, but

in 1937 it became a separate dependency from India, the executive authority being vested in a governor, acting on behalf of the Crown and an advisory council of ministers. Prior to the invasion of B. by the Japanese in 1941 there was a bicameral legislature, the Upper House or Senate of 36 members being partly elected (from the Lower) and partly nominated by the governor, and a Lower Chamber or House of Representatives of 132 members wholly elected. B. was divided into 7 administrative divs. under commissioners, 4 being in Lower and 3 in Upper B. The Shan States in the E. of Upper B., the Arakan Hills, and some other dists. were under special administration. In Dec. 1942 the governor, by a proclamation under the Government of Burma Act, assumed full executive and legislative powers. Military administration of the areas liberated before the Jap. surrender ceased in Oct. 1945, when full civil gov. was restored. In May 1945 the Brit. Gov. reiterated their considered policy of promoting full self-gov. in B. and their pledge to assist her political gov. until she reached a status equal to that of the Brit. Dominions and of the U.K. (Cmd. 6635). In the meantime, pending a general election and the restoration of normal conditions, Parliament approved the continuance, until Dec. 1948, of the proclamation issued in 1942 whereby the administration is carried on by the governor, who is directly responsible to the Brit. Gov. The Shan States, until recently, formed a minor administration distinct from that of B., though under the same executive gov. and not subject to the jurisdiction of the Burmese legislature. The Karenni States of Kantarawaddy, Bawlake, and Kyetboogyi lying to the S. of the Shan States (4200 sq. m., pop. 59,000) were feudatory states, but not part of B. Under the Constitution of the Union of B. (1948) the former federated Shan States and the Wa States are combined as the Shan State; while the former 3 Karenni States are to be known as the Kayah State. Each of these 2 states, as well as the Karen State and the Chins, is represented in the Union Gov. by a minister chosen from its own members of Parliament, and enjoys a considerable measure of administrative autonomy. In Britain some held that the pledge given to B. in 1931, that her prospects of constitutional advance would not be prejudiced by her separation from India, was amply fulfilled by the large measure of self-gov. conferred by the Act of 1935. But the Burmese themselves interpreted it to mean that their country had the right to advance *pari passu* with India. They resented the discretionary rule of the governor during the preparatory period, the provision that defence and external affairs should remain in his hands, the absence of any admission of B.'s right to leave or to remain within the Brit. Commonwealth, and the plan for an indefinite separation of the frontier regions from the rest of the country. Nationalism, now the driving force of Burmese opinion, was among the consequences of the Jap. invasion, while the

creation of a nominally 'independent' B. was the outcome of a resistance movement, a 'patriot army,' and the Anti-Fascist People's Freedom League. The Brit. Gov., however, justifiably proceeded with caution following the expulsion of the Japanese. For until the rudiments of an administrative structure could be restored, political advance would have been useless. But unfortunately the impression prevailed that Britain had no real intention of conferring autonomy on the country; and by the time Sir Hubert Rance became governor in the autumn of 1946 there was a dangerous gulf between the administration and the more progressive groups in the country. It was in these circumstances that Mr Attlee in Dec. 1946 announced Britain's determination to extend to B. the policy adopted for India. B. (he said) was to be free to choose whether or not to remain inside the Brit. Commonwealth; the executive council in B., as in India, was to carry on day-to-day administration without interference; and the approaching elections were to do duty, as in India, for the constituent assembly as well as for the legislature. In Jan. 1947 a delegation from the Burmese executive council came to London and concluded an agreement with the Cabinet under which the council became the interim gov. of B. It was also agreed that the common objective of the Brit. Gov. and the Burmese executive council was a free and independent B., whether within or without the Brit. Commonwealth of Nations. The elections for a constituent assembly were held in April, the result being an overwhelming majority for the Anti-Fascist People's Freedom League. The assembly in June resolved that B.'s constitution should be that of an independent sovereign rep., and in the same month a Burmese goodwill mission, under Thakin Nu, president of the assembly, came to London to discuss the question of transfer of power. By a statement made in Parliament by the secretary of state for B. on 24 July the Brit. Gov. agreed to recognise the interim gov. of B. as a full provisional gov. until legislation for the transfer of gov. was completed. Thus Thakin Nu, the senior member of the interim gov., became by convention the first Prime Minister of B., and his colleagues in the council or Cabinet were henceforth to enjoy the status and powers of ministers. B.'s smooth approach to independence, however, was marred by the assassination a few days previously of no fewer than 7 members of the Burmese executive council while in session at Rangoon, the assassins with Sten guns forcing their way into the council chamber and acting evidently at the instigation of the defeated U Saw, chief minister of B. in 1941, who was hanged for the murders in May 1948. The council, however, was at once reconstituted by the governor, Sir Hubert Rance. Among those murdered was U Aung San, only 33 years of age, who was one of 'Thirty Crusaders' who underwent military training in Japan. When B. was invaded by the Japanese, these comrades were promised, in return

for assistance, the reins of civil administration as various districts came into occupation. But they were tricked by the Japanese, and Aung San then opened negotiations with the British, the upshot of these negotiations being that the Burmese Defence Army rose against the invaders (April 1945). A treaty making B. an independent state outside the Brit. Commonwealth was concluded on 17 Oct. 1947, and its terms were implemented in the Burma Independence Act which was passed by the Brit. Parliament on 10 Dec. The Union of B. came formally into existence on 4 Jan. 1948, and on that day Sir Hubert Rance, the last Brit. governor, handed over authority to Sao Shwe Thaik, the first President of B. The Act brought an end to the suzerainty of the king over the Karen States, and under the Constitution of B. (passed on 24 Sept. 1947) all the frontier areas came within the federal framework of the union. See also SHAN STATES. Soon after gaining independence the Gov. of B. had to cope with rebellions by dissident groups—the Communists, the Karen National Defence Organisation, etc. A certain degree of peace was regained by 1951. In that year there was a general election in which the Anti-Fascist People's Freedom League gained a majority of votes. The next year the gov. embarked on the Pyidawtha scheme (Welfare State). In Mar. 1952 B. joined the Colombo Plan and was a member of the Afro-Asian Conference held at Bandung in April 1955.

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Burma, or Burma-Yunnan, Road runs between Lashio, N. end of the Burmese railway from Rangoon, and Chungking, Chiang Kai-shek's cap. In 1939-40. It was constructed between 1936 and 1938, after the Sino-Jap. war had been in progress for some time, with the object of providing the Chinese armies with an alternative route for supplies to that from the sea, which had been cut off by the Jap. advance southward. The chief use made of the road was as a means of transport for Russian munitions to China, and in July 1940 the Brit. Gov., in view of its difficult position from the collapse of France, felt compelled to agree to suspend temporarily the transit of war material and certain other goods via Burma. The closing of the road for even 3 months was

criticised in Britain as involving an example of the much derided policy of appeasement, and it was reopened after the expiry of the 3 months on 17 Oct.

Burma, Second World War, Campaigns in. The Jap. tide of invasion in 1941-2 soon overwhelmed B. The early surrender of Thailand gave Jap. forces a preponderating advantage over the Brit. defences. Very soon the Japanese had cut the B. Road (q.v.) and thereby isolated China. Moulmein was evacuated in Jan. (1942). In Feb. Martaban, on the Salween R., was taken, and this was followed by heavy fighting on the Billin and Sittang Rs. The Brit. forces, consisting chiefly of Indian troops, together with their Chinese allies, then took up defences on the Irawadi and Sittang fronts. But Rangoon had to be evacuated in Mar. Mandalay fell in the early days of May. A considerable part of B. was thus soon in Jap. hands.

The battle for Burma. When Japan attacked the Brit. Commonwealth and the U.S.A. B. was neither mentally nor materially prepared for war. Her premier, U. Saw, was a traitor to the Brit. connection. But it was hoped that Malaya could successfully resist the invader and thereby render B. immune. Most available troops, aircraft, and equipment were concentrated in Malaya and Singapore. In the whole of B., with a frontier bordering on potentially hostile ter. of 1600 m., there was but one diluted Burman div. guarding the long border of the Shan States, while the best part of another div. was spread along the 800 m. of the Tennesseim from Moulmein to Victoria Point. The Japanese had sev. alternative approaches into B. on which to concentrate their main drive; the defending forces had to disperse their scanty strength to guard against surprise at each of the approaches. The first serious contact was made E. of Tavoy (Dec.), after which the enemy attacked with a div. through Thailand on the Kawkairek Pass, which was guarded by an Indian brigade and the 7th Gurkhas. It was obvious from the start that the Japanese were receiving much assistance from Burmese fifth columnists.

In Jan. 1942 a heavy Jap. attack was launched against Moulmein. The outnumbered garrison fought its way to the jetties and, after inflicting heavy casualties on the enemy, successfully embarked. The problem now was to defend the direct approaches to Rangoon and the rail and road head at Martaban, together with the main crossings over the Salween R. and the long communications back to the Sittang bridge. The defending troops were now getting more effective air support; but although they had inflicted serious casualties on the enemy, they were not sufficiently numerous to thwart a flanking movement, and further withdrawal to Kyaikto was unavoidable. Another Jap. div. was rapidly approaching the Sittang bridge with the object of getting in between the 17th Div. and Rangoon. The bridge was lost and retaken sev. times before being blown up by the retreating British, and the Japanese

suffered 2000 casualties. The loss of the bridgehead, however, was disastrous and a large part of the 17th Div. was cut off and trapped between 2 Jap. divs. Most of them fought their way back through the jungle, abandoning all their heavy equipment. Thus the troops had to be re-equipped and reorganized at the very moment when Singapore had fallen and thereby released large Jap. reinforcements. Two Brit. battalions and some units of the Royal Armoured Corps had now reached B., and the imperial forces were concentrated in new positions in more open country near Pegu in the hope of covering Rangoon. Already, however, the Japanese had won control on the side E. of the Bay of Bengal and the cap. had to be abandoned. The tired and harassed imperial forces now retired towards the semi-isolation of Upper B., but, in anticipation of the situation that had now arisen, the Chinese Gov., to whom the link with India through B. was of vital importance, had dispatched some of their best troops to take over the left flank. But a serious threat developed late in April with the fall of Lashio at the E. end of the B. Road, and with this loss came a direct threat to Mandalay. By the end of the first week of May the Japanese took Mandalay and were able to continue their advance towards the N.E., the N., and the N.W. The Chinese were pushed back along the B. Road as far as the frontier of their own country by a Jap. armoured force; while another Jap. column pushed into the highlands of the N., towards Myitkyina, with the object of cutting off all communications between China and India through B. Brit. and Indian forces, with some Chinese, then withdrew towards the Indian frontier along the Chindwin R. Immediately afterwards the enemy took Akyab, only 50 m. distant from the frontier of India.

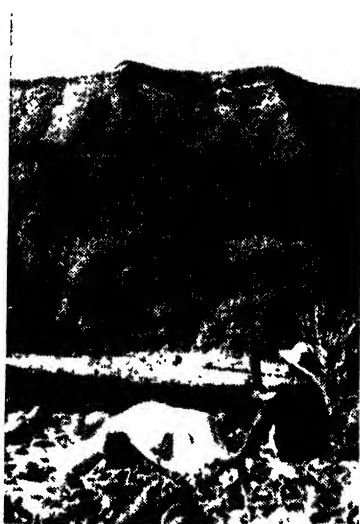
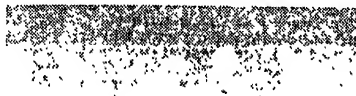
The loss of B. was a grave misfortune, apart from the danger to India, owing to the possible reactions of the defeat upon Chinese sentiment and the Chinese war effort. For B. was not only one of the richest countries in the world; it had valuable communications, land frontiers with countries in Jap. occupation, a series of magnificent aerodromes with hard runways, and it was a first-class point of re-entry into E. Asia for the Allies against the time when they would be able to concentrate armies and supplies for their counter-offensive. The fall of Rangoon fatally affected the ability of the Commander-in-Chief, India, to reinforce the defenders of B., and this inability cost the British the Burmese campaign. Earlier circumstances contributed to the defeat. Pre-war preparation for the defence of the country was inadequate for the immensity of the task, and the last-minute transfer of the B. Command to the India Command left no time for adequate preparations to be made. Moreover, the Brit. forces were insufficiently trained and organised for the kind of fighting they had to undertake; while the Japanese, lightly equipped, were well trained for jungle warfare. But the mixed Brit.,

Indian, and Chinese forces held out for 2 months, and their delaying rearguard actions proved invaluable to the Allies in the preparations for the defence of Bengal and India generally.

Renewal of the fighting in Burma during and after the winter 1942-3. No further operations of any note took place before the winter of 1942-3, when Brit. and Indian troops fought their way along the length of the Arakan peninsula, and Wingate (q.v.) raided hostile ter. with his long-range penetration columns. The Arakan campaign was a failure, partly owing to the lack of landing-craft for amphibious operations in support of the troops, and eventually the troops had to retire before Jap. counter-attacks. The 'penetration column' sorties or raids behind the Jap. lines were well conceived and executed. Wingate's presence in B. and the nature of his operations were kept secret until, in May 1943, it transpired that his long-range jungle force, which received its supplies entirely by air, had arrived in India from N. B. after spending 3 months as wreckers in the midst of Jap.-controlled country. His brigade, consisting of Brit. and Gurkha columns, with reconnaissance and intelligence detachments from the B. Rifles, penetrated hundreds of miles across jungle ranges and valleys. The R.s Chindwin and Irrawadi were crossed and the Myitkyina railway was cut in a hundred places. Skillfully infiltrating through the chain of enemy outposts and garrisons, the force penetrated enemy ter. as far as the Shan States. Much destruction was done, but Wingate's casualties were disproportionately heavy. Probably his force's greatest importance lay in the effect it had on the morale both of the Jap. and of the Brit. soldiers and general public.

The first offensive, attempted after Wavell (q.v.) became Commander-in-Chief, was directed towards Akyab. It failed, and a renewed attempt in 1944 under the supreme command of Mountbatten, who had been made Commander-in-Chief in S.E. Asia, soon came near to disaster; for in Feb. every Jap. soldier in the Arakan that could be spared was mustered for a violent counter-attack. This came in the form of a fierce punch, which drove straight through the front-line positions of the 7th Indian Div. in the Kalapanzin valley, and encircled about 10,000 Brit. and Indian administration troops of 15th Corps and 7th Div. H.Q. Mountbatten ordered the 26th Indian Div., who were in the Chittagong area, to the rescue immediately, and after 20 days' bitter fighting the enemy encirclement was broken. The allied offensive was soon renewed, and the main operation of the campaign fought before the monsoon of 1944 was that which was conducted under the Amer. general, Stilwell, with the object of helping China by building a road through N. B. to link Assam with the B. road to Chungking. Opposing Stilwell's line of advance, the chief objective of which was the enemy base of Myitkyina, was the Jap. 18th Div.; but the deep penetration of Wingate's 'Chindits' enabled them to cut the enemy's

communications and so rule out the 18th Div. as an offensive factor against Stilwell. By way of further aid to Stilwell 2 diversions were conducted, one in Arakan and the other in the Manipur Hills. A force of Amer.-trained Chinese troops under Brig.-Gen. Merrill was also advancing, some 200 m. to the NE., on a S. course, parallel to that of Stilwell's forces. The



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SUPPLIES BY AIR TO WEST AFRICAN
TROOPS IN BURMA

enemy, however, countered these moves by an advance on the Arakan front with the intention of invading India through Chittagong; and when his forces were utterly defeated by the Brit. Fourteenth Army of seasoned jungle fighters, he attempted to force a passage through Manipur state to Assam, and here he came within measurable distance of success by attacking Kohima and so threatening the vital Brit. road and rail communications through Assam.

Stilwell actually began his N. offensive from Ledo late in Oct. (1943) and, in the

ensuing 6 months, he led his very fine Amer.-trained Chinese divs., together with U.S. commandos, across the Patkoi Hills and through the Hukawng valley, over 200 m. of most difficult country, to push the Jap. 18th Div. to within 70 m. of Myitkyina, their main base and airfield in N. B. Wingate's Chindits co-operated by cutting the supply lines of these Japanese to the S., while a force of Gurkhas and Kachins was advancing on Myitkyina from the N. All these forces, including the Chinese, were supplied by air. Meanwhile columns of the Fourteenth Army crossed the Chindwin R. in support of Stilwell's forces, but were driven back on Imphal, main allied base in the NE. uplands of India and cap. of Manipur state, and Kohima, the important Brit. base in Assam, where the Japanese attacked strongly, and for some weeks there were fierce attacks and counter-attacks at both places.

At one time early in 1944 the Jap. military occupation of N. B. seemed to be precarious, but their advance between the Fourteenth Army's forward positions and their base at Imphal relieved their position. The Jap. command decided that the proper riposte to Stilwell's thrust was a counter-thrust through Imphal at the allied railway communications rather than direct opposition. The enemy now launched a counter-offensive across the Chindwin R., and a struggle began for the Imphal plain, and for the military roads, constructed since the withdrawal from B., that converged upon it. Slim's Fourteenth Army troops were concentrated to deal with enemy attacks on Kohima. By early April the Brit. and allied forces were in possession of the whole Imphal plain. But the enemy invaded Assam early in April and the Allies, unable to guard the Manipur road, running parallel to and behind the B. mt frontier, for all its course of 200 m., instituted the 'box' system of defence, under which strong points were organised for use later as bases of attack—the same system which had been successfully adopted in Arakan. A week after the initial Jap. entry into Assam, a Jap. column thrust behind the Brit. positions guarding the NE. approaches to Imphal; while another enemy force threatened Imphal from the S. The Japanese at this point had a great advantage in communications, for they held the Burmese waterways, railways, and roads, the Bangkok-Rangoon railway, and supply lines into Thailand and Indo-China. Against these, the Allies had their troop-carrier command—which had shown its value in relieving the Indians in Arakan and in carrying commando troops behind the enemy lines further N. combined with the air supremacy maintained by tactical, strategical, and reconnaissance air forces.

The position in mid May (1944) was that Slim's (q.v.) Fourteenth Army held a line in the W. of Manipur state, before Imphal, with the Jap. line extending in an arc from near Kohima, round the E. part of Manipur state, to Tiddim. Far to the NE. was Stilwell's Chinese army advancing on Myitkyina, with a Jap. div.

near Mogaung between Stilwell and the Brit. airborne troops located on the Bhamo-Myitkyina road S. of this enemy div. and in rear of the Japanese defending or counter-attacking near Imphal. The enemy, however, in attacking Slim's positions in Manipur, suffered disproportionately heavy losses and were now generally on the defensive. A 40-day pitched battle for Kohima ridge ended in the middle of May when the position fell to the Brit. forces, the enemy losing over 3000 dead, while Brit. casualties were also heavy. The main aerodrome at Myitkyina was captured by Merrill's force as the successful outcome of a daring march through rough and tortuous terrain in the mt. jungles of N. B. to the Mogaung valley. The whole of the Jap. communications in N. B. were now in jeopardy. Soon afterwards Merrill's forces, with reinforcements of airborne troops from Stilwell, penetrated the outskirts of the town of Myitkyina (18 May).

The land fighting over the scattered Indo-Burmese fronts did not cease with the monsoon, though the rains made new campaigns impossible. Stilwell had made valuable gains in N. B. and allied air supremacy was further emphasised; but, on the whole, the pre-monsoon campaigns had been rather disappointing, especially on the Arakan front, which had now become a purely holding campaign to prevent Jap. incursions into Bengal. But at least the dangers to Imphal and Kohima, so acute in Mar.-April, had passed, though all fighting remained on the Indian soil of Manipur state, and it was a question how far back towards their Chindwin R. bases the Japanese could be pushed with weather conditions steadily growing worse. Other appreciable gains were the freeing of the Imphal-Kohima road, which resulted in the reopening to the Allies of the vital Dimapur-Imphal road; and the capture of Mogaung by Chinese troops and units of Gen. Lentaigne's force (25 June).

The road to Mandalay. Chinese and Amer. troops had entered Myitkyina on 18 May, but so fierce was Jap. resistance that not until 3 Aug. was the garrison destroyed. The capture of Myitkyina increased the protection of the air routes to Chungking—the remarkable ferry service 'over the hump' of the Himalayas which was now transporting a great tonnage of supplies.

The victory won in B., notably by the magnificent defensive battle of Manipur, to which battle-ground the Japanese were skillfully enticed with consequently enormously increased difficulties of communications, was scarcely realised at this time by the world which was preoccupied with the encounters in Europe. By the beginning of 1945 more than a quarter of B. had been liberated and the spearhead of the Fourteenth Army was only some 20 m. from Mandalay.

The Japanese broke off the battle for Manipur in July, retiring in disorder and dying of starvation and disease. It was vital that they should be given no chance to reorganise and make a stand on the

Chindwin R. The enemy were retiring by 2 main routes—the Tiddim road and the Kabaw valley, both running N. and S. Down the Tiddim Slim sent the 5th Indian Div. with orders to destroy the remains of the Jap. 31st Div. and get through to Kalembo. Down the Kabaw valley went the 11th E. African Div. (see KING'S AFRICAN RIFLES), which was new to campaigning outside Africa. Plunging through the jungle over roads a foot deep in mud, they never lost touch with the Japanese, and finally joined up with the 5th Indian Div. at Kalembo, forced their way through the gorge to Kalewa, took it, and were on the Chindwin. Thus by superb fighting Slim's forces had reached the riv., the enemy had no time to re-form, and there were fully 5 months to elapse before the monsoon would start once more.

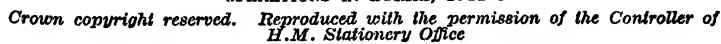
While this was happening, Sultan—who had succeeded Stilwell—was pushing down from N. B. His 36th Brit. Div., having left Mogaung, was held up for some time short of the railway junction at Naba but had now resumed its southward march, relying solely on the air for its supplies. Further E. the Chinese 38th Div. had moved S. from Myitkyina, surrounded Bhamo, and pushed on, also in the direction of Mandalay. Bhamo fell on 15 Dec. after a month's siege.

Capture of Katha on the Irawadi: fall of Akyab. It was at the end of Nov. that the campaign had taken a sudden change. The Fourteenth Army crossed the Chindwin and was committed to the daring manoeuvre of taking Mandalay from the N. The crossing of the Chindwin had an immediate result. Resistance crumbled before the 36th Div., which then captured Katha, the chief enemy base on the R. Irawadi. The speed of the advance increased on all fronts. The Indian corps swept over the mts on the E. bank of the Chindwin, reached the railway, and joined up with the 36th Div. The advancing forces now stood but 20 m. from Mandalay.

During these events in N. B. Akyab in the far S., the chief Jap. base in Arakan, fell without a battle. Almost simultaneously Christison's amphibious forces landed at Myepon to get in the rear of the Japanese trying to escape southwards.

Fresh advances on Mandalay and Sagaing, 2 of the main enemy bases on the B. front, began in mid Jan., following a terrific concentration of bombs dropped by the R.A.F. on military installations and troop formations in Mandalay. Indian troops from Nepal had struggled

opened.
standing event of Jan. was the opening of the Ledo road to China. The Japanese cut the old B. road, on which China was wholly dependent for war material, early in 1942. Towards the end of that year the Allies began the construction of a new road from Ledo, the railhead on the mountainous E. frontier of Assam. It was a vast undertaking, involving road construction over 300 m. of the most difficult country in the world, between Ledo and Myitkyina



on the Irawadi; but it was accomplished by Brit., Amer., and Indian engineers with the help of African, Indian, and Chinese troops and labourers, and the new road was now open right through. Meanwhile the 26th Indian Div. of the 15th Corps were engaged in successful amphibious operations against Ramree Is (21 Jan.). This was followed shortly after by a landing on Cheduba Is. by Royal Marines. Operations in the Arakan had been looking up 4 allied divs.; Sir Oliver Leese, Commander-in-Chief allied land forces, saw a way of amending this by staging a series of landings in the enemy's rear along the Arakan coast while exerting pressure from the N. Further landings at Myebon, Kangaw, Ru-Ywa, and Letpan followed, in which commandos, infantrymen, tank crews, gunners, and naval and air forces all played a gallant part, and started a full-scale Jap. retreat southwards. Thus was achieved the second of Leese's aims—the release of the Arakan forces for other operations. The bloodiest battle of the whole war in B. was now being fought at Gangaw (or Kangaw) in Arakan, where for 3 weeks thousands of Japanese had been trying to break southwards—their only road to safety—through the road block formed by the 15th Indian Corps. On 22 Jan. (1944) Brit. and Indian troops entered the large tn of Monywa on the Chindwin R., 60 m. W. of Mandalay. But the crucial point of the approach battles for Mandalay was 60 m. N. of the city, where Brit. and Indian troops held strong bridge-heads on the Irawadi in face of fanatically directed counter-attacks. Mid Feb. still saw the enemy fighting hard round Mandalay, but they were being steadily pressed back.

Battle for the Burma oilfields; Mandalay battle opens. Fourteenth Army troops, on 14 Feb. (1945) crossed the Irawadi near the anct city of Pagan (q.v.), which they seized. Here the riv. is more than a mile wide, being swollen by the waters of the Chindwin, and near the far bank the Brit. troops came under murderous fire from machine-gun nests in the caves and tunnels of the cliffs. This crossing gave the Allies a new bridge-head 4 m. deep, N. of Chauk, the second biggest oil-producing tn of B. The battle for the great B. oilfields was now beginning. The crossing of the formidable riv. barrier, and the forcing of the enemy to conform to the allied plan, had been achieved and the real battle for Mandalay was on the point of opening. But the line of the Pagan force was fantastically bad and most of the supplies had to be carried by air. In a surprise armoured thrust of 85 m., supported by airborne forces, the Fourteenth Army, striking E. from the Pagan bridge-head, virtually cut off the Jap. army of 40,000 defending the Mandalay area. In this thrust, after a 5-day struggle, they captured Meiktila, the second largest tn of central B., with 8 airfields. Driving still further E. they took Thazi, and thereby captured the road and railway junction from Mandalay to Rangoon, leaving the enemy only an

escape route over the difficult Shan hill country. An armoured column of the 19th Indian (Dagger) Div. swept through the city limits of Mandalay on 8 Mar. and were soon only a mile from Fort Dufferin, the centre of the city. The walls of the city were pierced by men of the 15th Punjab, while other Punjabs stormed Mandalay Hill, the pagoda-covered landmark in the N. section of the city. Other forces of the div. were now fighting below Madaya, 13 m. N. of Mandalay, on the southward route from the Singu bridge-head E. of Shwebo. To the NE. of Mandalay Lashio and its main airfield were captured by the Chinese First Army. Thus the whole B. road from Lashio to Kunming had now been cleared, for Sultan's forces had advanced sufficiently far S. to protect the new overland supply route—the Stilwell road—opened 6 weeks earlier.

Fall of Fort Dufferin; triumph of aerial transport. The occupation of Mawmyi, on the main road and railway between Mandalay and Lashio, by Indian troops was another blow to the Japanese in central B. Its capture sealed off Jap. routes from central B. into the Shan States and Siam. Other troops of the 19th Indian Div., fighting through the anct city of Mandalay, were now meeting stronger opposition, chiefly because the Japanese were trying to get their supplies out of Mandalay, and so fought hard to preserve the entrance to Fort Dufferin. On 19 Mar. Eng. and Scottish troops occupied Ava, the old cap. of B., opposite Sagaing on the Irawadi. Brit. troops also took Amarapura, another of the anct caps. of B., lying 6 m. S. of Mandalay. Fort Dufferin fell at last on 20 Mar. to the 19th Indian Div. Thus fell Mandalay, second city of B., and its fall was an indication of the great progress made by the Allies in the liberation of the country. The campaign leading to this victory had involved great feats of military engineering and marching over what were, perhaps, the most difficult lines of communication in any theatre of war. The crossing of the Irawadi alone, at points where it is 6 times as wide as the Thames at Waterloo Bridge, was an epic achievement. All these great land advances were only made possible by the untiring efforts of the Brit. and Amer. airmen. In 1 year the 33rd Indian Corps under Sir Montagu Stopford, from the time of the relief of Kohima and Imphal, cleared the enemy from 32,000 sq. m. of India and B., killed 20,000 Japanese, and captured 251 guns. A vital factor in the success of the Allies in the Burmese campaign was the use of air transport, especially from the time when the campaign reopened in the autumn of 1943. Great experience had been gained in aerial transport, and the arrival of more transport squadrons allowed of much extended operations. The large-scale use of air supply in the Arakan operations was the turning-point in the war in B. So long as the allied forces stood their ground instead of trying to fight their way back past the road-blocks erected by the Japanese to cut

them off, the supply problem of the enemy remained insoluble. Although the Japanese fought tenaciously, without reinforcements of munitions their fate was sealed. When the second Wingate expedition set out, its operations depended entirely on the weapon which had only recently thwarted the Japanese in the Arakan battle, namely air supply; and not merely did the allied troops establish themselves in the middle of enemy-occupied territory, but they built improvised landing-grounds for the reception of supplies, and it was during that campaign that gliders were so successfully used to carry equipment. The climax of the campaign was the assault on Myitkyina, in which transport aircraft were used in a series of permanent advances in which forward landing-grounds were rapidly built to forestall all enemy counter-attacks.

With the occupation of Chauk (18 April), Magwe (18 April), and Yenangaung (22 April) the capture of the B. oilfields was complete. Yenangaung was the main centre of production, and until this time that place had had the heaviest concentration of Jap. anti-aircraft guns in all B.

British capture Rangoon; battle of Burma ended. Toungoo, 165 m. N. of Rangoon, and its 3 airfields were captured on 22 April by the Fourteenth Army, which had advanced 50 m. in a week. Four days later the advancing columns had reached Pegu, junction of the railway to Thailand, and were therefore through the last natural defensive position held by the Japanese before Rangoon, a defile through which runs the trunk road and railway. The powerful armoured columns were unable to deploy here and the defile was forced by the infantry. For some days past the enemy had been evacuating Rangoon. They fought well on the whole, and many suicide attacks were made on the tanks by men running up with magnetic mines. The Jap-sponsored army of B. was now co-operating actively with the Fourteenth Army. Pegu was attacked on 1 May. A heavy barrage was laid down on the vil. by nearly 100 guns. Men of the W. Yorks and Border Regiments, with Punjabis, then mopped up the enemy holding force, which in fact consisted of the remnants of the evacuated Rangoon garrison. The last road usable by motor transport and the last railway by which the enemy in Lower B. could escape to the E. were now denied them. The next task was to bridge the broad Pegu R. This accomplished, the armoured columns were soon thundering down towards Rangoon in a race as much against the approaching monsoon as against the Japanese. After bomber raids on the Jap. defences, Brit. paratroops landed on 1 May S. of Rangoon, followed the next day by forces landed from Brit. ships on both banks of the Rangoon R. S. of the city. Any Jap. troops in the Rangoon area were thus trapped between 2 allied forces who were now carrying out a pincer movement, while other troops of the Fourteenth Army were fast moving on the cap. from

the N. Troops of the allied land forces entered Rangoon on 2 May. The fate of the Japanese still resisting in W. B. was sealed with this entry and with the capture of Promo on the Irawadi, 180 m. N. of Rangoon, which latter capture cut the escape route of the enemy into the Arakan area. In a series of battles of great intensity over the previous 15 months the Jap. armies in B. had been so decisively defeated that they were unable effectively to defend Rangoon. Ninety-seven thousand of their dead were counted over that period, and their total casualties were 250,000. Allied total casualties, including Chinese, were not half this total. The fall of Rangoon, 10 days before the monsoon broke, brought to an end the battle of B., for although pockets of enemy resistance remained their doom was certain. The occupation of the cap. by a combined operation was the culmination of a long series of concerted operations carried out by the Fourteenth Army, which crossed the Chindwin and Irawadi R.s. to break into central B.; by the Amer. and Chinese forces of the N. area command, which advanced from the N. to Lashio; and by the 15th Indian Corps, which carried out a series of amphibious hooks down the B. coast. All these operations were supported and supplied by air.

Jap. forces E. of the Mandalay-Rangoon railway were now hastening their retreat over the Shan Hills to Siam, but were being constantly pounded by Brit. aircraft. Other Jap. remnants were being driven southward along the banks of the Irawadi by 2 Brit. columns, which were seeking to trap them in SW. B. before the monsoon broke. Although from the strategical point of view the issue of the Burmese campaign had been settled, a large area of the country still remained to be cleared of the enemy. This area included the Shan Hills and the Salween R. basin, the S. part of the Arakan coast, and the area of the Pegu Hills between the old B. road and the lower Irawadi valley. 'Mopping-up' operations, which had been intensified daily since the reoccupation of Rangoon, almost constituted a campaign in themselves, for there remained some 60,000 Jap. troops to be driven out of the country.

Japanese forces marooned. Gradually these forces were reduced, but in a country of such great distances, such difficult terrain, and during the monsoon it was not possible to drive the Japanese into restricted areas and annihilate them. To the NE. of Mandalay they had been driven well back into the hills where they had next to no guns and but little equipment. In the S. the situation was different. Here the obvious land route of advance was from Pegu across the Sittang, Bilin, and Salween R.s. to Moulmein. Holding the line of the Sittang were the remnants of the Jap. armies from central B., very short of transport and with only a few mt guns, but nevertheless a considerable obstacle. The Brit. Twelfth Army held the line of the road and railway from Rangoon to Mandalay. W. of this line was a force of about 10,000 Japanese cut off in

the Pegu Yomas and made up of the remnants of the Jap. Twenty-eighth Army, with elements of the 54th and 56th Divs. But by 27 July the Japanese, penned in the foothills of the Pegu Mts, had lost more than 5000 men in their desperate effort to break through the allied lines and across the Sittang into Siam.

Japanese surrender in Burma. The war with Japan, however, ended abruptly in mid Aug., following the dropping of atomic bombs on the Jap. homeland (see PACIFIC CAMPAIGNS IN SECOND WORLD WAR). It only remained for envoys to reach the various allied H.Q. to sign instruments of surrender, a process delayed by distances, especially in B., where fighting went on in the Karen Hills despite the general surrender of 14 Aug. But, acting on Mountbatten's orders, Jap. representatives signed a preliminary agreement at Rangoon on 27 Aug. in order to enable relief to reach prisoners of war quickly, and to facilitate the reoccupation of SE. Asia when the general instrument of surrender was signed in Tokyo on 2 Sept. The final instrument for the surrender of B. to the Brit. Twelfth Army was signed at Gey. House, Rangoon, on 13 Sept. by Jap. envoys acting in the name of F.-M. Count Terauchi, supreme Jap. commander of the S. armies. See *The Campaign in Burma* (H.M.S.O.), 1946; M. Collis, *Last and First in Burma*, 1956; Str W. Slim, *Defeat into Victory*, 1956.

Burma-Siam Railway, line from Tana Besar, 30 m. S. of Monimeln, to Banpong, 55 m. W. of Bangkok, thus linking the Burma and Siam railway system. Work on a projected route was first begun in 1912, but was soon abandoned owing to the exceptionally unhealthy climate. In Oct. 1942 the Jap. conquerors of Burma decided to build the line for military reasons, using the manual labour of Dutch and Brit. war prisoners, and conscript coolie labour. The prisoners worked in appalling conditions, were treated with great brutality, and lacked adequate food and medical attention. The railway (over 280 m. long) was completed in Nov. 1943, at the cost of over 63,000 lives—those of over 13,000 allied prisoners and about 50,000 coolies—out of a total labour force of about 150,000 (over 50,000 whites and 100,000 coolies).

Burma Star, decoration instituted in 1945 for service in the Burmese campaign beginning 11 Dec. 1941, until the end of the campaign. The ribbon is dark blue, with a central red stripe and in addition 2 orange stripes.

Burmman, Pieter (1668–1741), Dutch classical scholar, usually known as the elder to distinguish him from his equally famous nephew. He was b. at Utrecht, and commenced his studies at the univ. there. He was intended for the legal profession, but later became prof. of hist. and eloquence at the univ. of Utrecht. Next he became prof. of Gk language and eloquence at Leyden, and finally prof. of hist. for the United Provs. and chief librarian. Amongst his more important pub. may be mentioned odes, of Phaedrus, 1693, Horace, 1699, Justin,

1722, Ovid, 1727, Suetonius, 1735, and Lucan, 1740.

Burmman, Pieter (1714–78), nephew of the above, b. Amsterdam. He studied under his uncle at Leyden, and made a special study of law and philology. He became prof. of hist. and philology at the univ. of Amsterdam. He pub. many eds. of classics, together with an anthology of the Lat. epigrammatists, 1759–73. Authors ed. by him include Virgil, 1746, Claudian, 1760, Propertius, 1780, and Aristophanes, 1760.

Burmmaniaceae is a small family of monocotyledonous plants found in tropical forests. The flowers are bright blue, and the plant is a saprophyte. The chief genus is *Burmmania*, of which there are some 30 species.

Burn, Richard (1709–85), legal writer, b. Westmorland and educ. at Queen's College, Oxford. He took holy orders and became vicar of Orton. He devoted his life to the study of law. His two most famous works were *The Justice of the Peace and Parish Officer*, and *Ecclesiastical Law*, which was regarded as the standard authority on that subject for a great many years.

Burnaby, Frederick Gustavus (1842–85), traveller and soldier. The son of a clergyman, he was educ. at Harrow, and entered the Royal Horse Guards in 1859. He acted as Carlist correspondent of *The Times* in 1874, and later went to Khar-toum to investigate and report upon Gordon's expedition. He achieved fame through the travelling feat of crossing Russian Asia on horseback, which is described in his *A Ride to Khiva*. His love of excitement found vent in a series of balloon ascents, in one of which he crossed the Channel. Later he was wounded in action at El Teb in 1884. He d. fighting at Abu Klea.

Burnand, Sir Francis Cowley (1836–1917), humorist, b. London. His mother, Emma Cowley, was descended from the author, Hannah Cowley. Educ. at Eton and Cambridge, he adopted law as a profession, though he had formerly studied first for the Anglican, afterwards for the Catholic Church. He founded the Amateur Dramatic Club at Cambridge and made dramatic writing his work. *Black-eyed Susan*, 1860, a burlesque, made a great hit. He succeeded Tom Taylor as editor of *Punch*, from 1880 to 1906. He pub. *Happy Thoughts*, 1868, many other popular books, and an autobiography, *Records and Reminiscences*, 1904.

Burns, Sir Owen Tudor (1837–1909), Eng. soldier, was drafted in 1856 to India with his regiment, the Lancashire Fusiliers, the mutiny having broken out. Owing to his knowledge of Hindustani, he was soon appointed brigade-major. At the assault of Kalsar Bagh he led the attacking column. Sir Hugh Rose, impressed with his work as adjutant, appointed him private secretary in 1862, and he held a similar position under Lord Mayo in 1868, and under the viceroy, Lord Lytton, 1876–8. B. was with the former when he was murdered in the Andaman Is.

Burne-Jones, Sir Edward Coley, Bart. (1833-98), painter, b. Birmingham. He was an only son, and of Welsh extraction, and the idealism of his character and his art has been attributed to this Celtic strain. He was educ. at King Edward's School, Birmingham, and intended for the Church. In 1853 he entered Exeter College, Oxford. Here he met Wm Morris (q.v.), and the couple became fast friends, the two agreeing to devote themselves to art. Both came under the influence of Rossetti, and as a result of their meeting in 1856, B. left college, settled in London with Rossetti's encouragement, and acquired the latter's enthusiasm for Arthurian romance and medieval art and literature. B.'s early water-colours, notably 'Siddonia von Bork' show the force of Rossetti's example. He assisted (1857) in the famous scheme to decorate the walls of the Oxford Union; later he was Morris's right-hand man in his idealistic efforts to revive and improve craftsmanship and design on Pre-Raphaelite lines. He married Miss Georgiana Macdonald in 1860, and in 1862 the couple accompanied Ruskin on his tour to Milan and Venice. In 1864 he was elected an associate of the Society of Painters in Water Colours. He became A.R.A. in 1886, but later resigned, and in 1894 he was made a baronet. A wistful nostalgia characterises his paintings, such as 'King Cophetua and the Beggar Maid,' 'The Golden Stairs,' 'Pan and Psyche,' and 'Chant d'Amour.' B.'s influence has shown itself far less in painting than in the sphere of decorative design. Here it has been very marked indeed, particularly in designs for stained glass. Specimens of these executed from his cartoons are to be found all over the country. See M. Bell, *Sir Edward Burne-Jones*, 1892; A. Vallance, *The Decorative Art of Burne-Jones*, 1900; Lady Burne-Jones, *Memorials of E. Burne-Jones*, 1904.

Burnell, Arthur Coke (1840-82), Sanskritist. Entered the Indian Civil Service in 1857, and, after a course of Sanskrit and Telugu, went out to Madras in 1860. There and in other important centres he copied and acquired Sanskrit MSS. Thus, in the course of time, he formed a splendid collection, which he later presented to the India Office Library. He pub. treatises on Hindu law, trans. of and commentaries on Sanskrit works; studies on S. Indian dialects; and historical tracts. Apart from his profound knowledge of Sanskrit and S. Indian languages, he knew Arabic, Tibetan, Kawi, Javanese, and Coptic. His *Handbook of S. Indian Palaeography*, 1874, and *Classified Index to the Sanskrit MSS. in the Palace of Tanjore*, 1880, are standard works.

Burnes, Sir Alexander (1805-41), soldier, traveller, and explorer, b. Montrose. At an early age he entered the service of the E. India Co. He proposed the exploration of the NW. Provs., which at that time were practically unknown, and in 1831 went to Lahore on a special mission. In the following year he started on the tour which took him across the Hindu Kush, to Bokhara and Persia. The book which he

pub. on his return to England obtained for him the recognition of the Brit. and Fr. geographical societies. On his return to India he went on a special mission to Kabul, and was later political agent there. He was assassinated by the Afghan mob in 1841, meeting his death bravely. His pub. were *Travels into Bokhara*, 1834, and *Cabool*, 1842.

Burnet, Gilbert (1643-1715), historian and bishop, was b. Edinburgh, and educ. at Marischal College, Aberdeen, and first studied law; but in 1661 he took orders in the Episcopal Church, which had just been restored in Scotland on the Restoration. He accepted the living of Saltoun in Haddingtonshire. In 1669 he was appointed prof. of divinity in the univ. of Glasgow. In 1673 he pub. his *Vindication of the Church and State of Scotland*, and in 1676 *Memoirs of the Dukes of Hamilton*, an account of the civil wars in Scotland. In 1674 B., not being able to accept Lauderdale's solution of the Scottish Church question, came to London, where he was given the chaplaincy of the Rolls Chapel, and later he became lecturer at St. Clements. Between the years 1679 and 1681 appeared his *History of the Reformation of the Church of England*, for the first 2 vols. of which he received the thanks of Parliament. B. was a convinced Whig, and a Broad Churchman, with ideas of religious toleration which were advanced for his age. His moderate views tended to alienate him from both political camps; but he refused the offer of sev. bishoprics from Charles II and on the accession of James II, he left the country and travelled in Europe, but finally settled in Holland, and gained considerable influence over William of Orange. He returned to England with him, and was appointed bishop of Salisbury (1689). B. preached the coronation sermon and had charge of the succession bill, 1701. He suggested the scheme which was afterwards adopted in the provision known as Queen Anne's Bounty (1704), but his influence declined a good deal under Anne. His greatest work, *History of my own Time* (pub. 1723-34), is a valuable, if prejudiced, account of contemporary events. See T. E. S. Clarke and H. C. Foxcroft, *A Life of Bishop Burnet*, 1907.

Burnet, John (1748-1868), painter and author, b. Fishrow, near Edinburgh. His first-class engravings of the works of Wilkie first brought him renown. 'The Greenwich Pensioners' is the best and most popular of his own works, and was painted in 1837. He also wrote with authority upon art, his most important productions being *A Practical Treatise upon Painting*, 1827, the editing of *The Discourses of Sir Joshua Reynolds*, 1842, *Rembrandt and his Works*, 1849, and *Turner and his Works*, 1852.

Burnet, John (1863-1928), Hellenist regarded as the foremost Gk scholar of his day in Great Britain, b. Edinburgh, and educ. at Edinburgh and Oxford Univs. He was a master at Harrow (1888), and a fellow of Merton College, Oxford (1890). In 1892 he was appointed

prof. of Greek at St Andrew's Univ., and remained there until his retirement as emeritus prof. in 1926. In the previous year he visited the U.S.A. as Sather prof. of Greek at the Univ. of California. His pubs. include *Early Greek Philosophy*, 1892, based on Zeller's *Philosophy of the Greeks*, *Greek Rudiments*, 1897, *The Nichomachean Ethics of Aristotle*, 1899, *Platonis Opera*, 1899-1907, *Aristotle on Education*, 1903, *Plato's Phaedo*, 1911, *Euthyphro, Apology and Crito*, 1914, *Greek Philosophy: Part I, Thales to Plato*, 1914, and *Higher Education and the War*, 1917.

Burnet, Sir John James (1857-1938), architect, R.A., son of the architect, John B. Studied at École des Beaux Arts, Paris. Entered his father's office in Glasgow and, later, founded his own firm in London. His most outstanding work is the King Edward VII Memorial Galleries in the Brit. Museum, 1905-14. Other buildings which he designed were, in Glasgow, extensions to the Univ., the Royal Institute of Fine Arts and the Athenaeum; in London, the Kodak building, Kingsway, the General Accident, Fire, and Life Assurance Co.'s offices, Aldwych, Adelaide House (London Bridge), and the Institute of Chem. His war memorials include the Cavalry Memorial, Hyde Park; the Jerusalem War Cemetery; and the Indian War Memorial in Port Tewfik, Egypt.

Burnet, Thomas (1635-1715), divine, b. Yorks, and educ. at Clare College, Cambridge. He became a fellow of Christ's, and later senior proctor of the Univ. Later he became master of Charterhouse, and in this position he did his best to prevent the Catholic appointments of James II. He became clerk of the closet to William III, in succession to Tillotson, but by reason of the outcry raised by the pub. of his *Archaeologiae Philosophicae*, was forced to retire. He retired to Charterhouse, where he d. His two most famous pubs. were *Telluris theoria sacra*, 1681, a work in which he put forward a fanciful idea of the structure of the earth, and which he afterwards trans. under the title of *The Theory of the Earth*, 1684; and the book already referred to, *Archaeologiae Philosophicae*, which he afterwards rendered into English. In this latter work he treated the Mosaic account of the creation as an allegory, with the result above mentioned.

Burnet. *Sanguisorba* (synonym *Poterium officinale*) is the Great B., a perennial herb with hermaphrodite flowers, found in Britain and Europe; and *Poterium sanguisorba* the Salad B., with lower flowers male, middle hermaphrodite, and upper female, in globose heads, native to Britain and parts of Europe.

Burnet Saxifrage, see PIMPINELLA.

Burnett, Frances Eliza Hodgson (1840-1924), Anglo-Amer. novelist, b. Cheetham Hill, Manchester, daughter of Edwin Hodgson, house furnisher and decorator, who settled in Tennessee at the conclusion of the Amer. Civil war. In 1873 she married Dr Swan B. and toured Europe. She obtained a divorce from Dr B. in 1898, and married Stephen

Townsend in 1900. Her first successful production was *That Lass o' Lourie's*, which appeared in *Scribner's Magazine* in 1877. *Haworth's*, her next novel, was pub. in 1879. Her chief works following these two were *A Fair Barbarian*, 1881 and *Through one Administration*, 1883, and (by far her most famous book), *Little Lord Fauntleroy*, 1886, a saccharine picture of childhood. See her own reminiscences, *The One I Knew Best Of All*, 1893.

Burnett, George (1822-90), Scottish writer on heraldry, was called to the Bar in 1845. He early interested himself in Scottish genealogy, and wrote the greater part of a *Treatise on Heraldry*, 1892. His most valuable work is his *Exchequer Rolls, 1264-1507*, at which he worked from 1881 to 1890. Its 12 vols. contain much that is indispensable to the true appreciation of his country's hist. In 1866 he held the office of Lyon king of arms.

Burnett, James, see MONBODDO, LORD. Burnett's Fluid, deodorant introduced by Sir Wm Burnett (1779-1861). It consists of a solution of zinc chloride which decomposes the strongly smelling ammonium sulphide, forming zinc sulphide and ammonium chloride, both of which substances are practically without odour. To burnettise wood or fabrics means to saturate the material with zinc chloride solution; this process prevents decay.

Burney, Sir Ceall (1858-1929), Brit. admiral, son of Capt. Charles B., superintendent of Greenwich School. Lieutenant of the *Carysfort* in Egyptian and Sudanese campaigns, 1882 and 1884. Rear-admiral, 1909; blockaded Montenegro and Albania, 1913. Vice-admiral, 1913. In Jutland battle on board the *Marlborough*. Second Sea Lord, 1917. Admiral, 1919. Admiral of the Fleet, Nov. 1920. Baronet, Jan. 1921.

Burney, Charles (1726-1814), Eng. doctor of music and writer, b. Shrewsbury. Educ. at the free school of that city and at Ochester; for 3 years he was a pupil of Dr Thomas Arne (q.v.) in London. He was an organist, a very minor musical composer, but a first-rate historian of music. Being threatened with tuberculosis, he accepted the position of organist at King's Lynn, Norfolk, and here he conceived the plan of his *History of Music*, which did not, however, begin to appear until 1776, or some 6 years after his travels (1770-2), to many of the prin. cities of the Continent to collect materials. Before the appearance of his *History* he pub. the results of his observations on contemporary music in 3 vols.—one in 1771 on the state of music in France and Italy, which was praised by Johnson, and the other on the state of music in Germany and the Low Countries (2 vols.), 1773, the matter of both works being later incorporated in his *History*. The first vol. of the *History* is a dissertation on the music of the ancients, and owes something to Padre Martini's similarly entitled *Storia della Musica* (Bologna, 1757-70). The great merits, however, of B.'s work have always

been acknowledged, though the work did not escape some severe criticisms. Apart, however, from errors and omissions to be expected in a large-scale and difficult work, the only really substantial faults are B.'s treatment of earlier music as merely preparatory to that of his contemporaries and his quite inadequate treatment of Bach in the fourth vol., a lack of appreciation which was shared by B.'s contemporaries. When, later, B. made the acquaintance of the '48' and other works, his enthusiasm for Bach was as great as his previous indifference. Dr Johnson was among his many admirers, whilst he owed to Edmund Burke his position as organist at Chelsea Hospital, 1783-1814. His life, written by his more famous daughter, Fanny, Mme d'Arblay (see BURNLEY, FRANCES) appeared in 1832. See also P. Scholes, *The Great Doctor Burney*, 1948.

Burney, Charles (1757-1817), classical critic. His father was Charles B. (1726-1814); b. at King's Lynn in Norfolk, he was educ. at Charterhouse and Caius College, Cambridge. B. d. at Deptford. His works include *Remarks on the Greek Verses of Milton*, 1790, *Tentamen de Metris Aeschyl*, 1809. His valuable library was acquired by Parliament and deposited in the Brit. Museum as 'the Burney Library.'

Burney, Frances (Fanny) (1752-1840), novelist, b. King's Lynn, Norfolk, daughter of Charles B. (q.v.). In 1761, a year after the family's removal to London, Mrs B. d. Fanny was never 'placed in any seminary'; nevertheless, at the age of ten, she had already taught herself to read and write, and at once showed a delight in putting both the arts into constant practice. Her precocity as an authoress was probably due to the fact that, at her father's house, she was continually being introduced to the leading men of the day both in music and literature. Still, at the age of fifteen, she was induced to burn her MSS., as her stepmother considered the practice of scribbling unladylike. Her first and best novel, *Evelina*, was actually pub. in 1778, but the story had been planned whilst Fanny was still in her teens. It was brought out in utmost secrecy, but the father was very proud of Fanny when she was admitted into the fellowship of the most distinguished literary people of the day. Johnson, who was her friend and admirer until death, declared that some passages in *Evelina* would do honour to Richardson. She received £20 in all for this novel. Burke, so the story goes, sat up all night to read it, and Reynolds would not touch his food until he had reached the end. For 5 years, 1786-91, Miss B. earned £200 a year as second mistress of the robes to Queen Charlotte. She resigned this post when her health failed and accepted a pension of £100 a year, 'a munificence I had little expected or thought of' (*Diary*, 4 June 1791). She married a Fr. officer, M. d'Arblay (d. 1818) in 1793, and lived with him in France from 1802 to 1812. Their son was b. in 1794. Her other stories were *Cecilia*, 1782, *Camilla*, 1796, and *The*

Wanderer, 1814. Her famous *Diary and Letters*, which extended over 72 years, appeared posthumously between 1842 and 1846. The property known as Camilla Lacey, in Surrey, destroyed by fire in 1919, was built out of the subscriptions (£3000) for the novel *Camilla*. It was always her ambition to write, as Sheridan suggested, for the stage, and in 1795 she wrote a tragedy, *Edwy and Elvira*, in the hope of increasing her then slender income, but the play was a failure. Much earlier in life she wrote a comedy, *The Wivings*, but, by the advice of her father, it was not put



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upon the stage. Her only remaining work was a life of her father (1832), written in an extraordinarily grandiloquent style. She d. in London. She was by nature somewhat prudish and self-effacing, quite unlike the *bas bleus* of the day, yet authorities agree that her amazing egoism detracts from the charm of her autobiography. Some of her characteristics were family affection, loyalty to friends, a vein of snobishness, and a curious insensitiveness. In the *Early Diary and Letters* and the remarkably fresh *Evelina* there is strong evidence of a great natural talent that promises a rich harvest. Yet her later novels, *Cecilia*, *Camilla*, *The Wanderer*, and even the *Memoirs* of her father, are all disappointments. She may have been intimidated by the praise and friendship of Johnson, Walpole, Burke, and Reynolds that resulted from so unstudied a novel as *Evelina* or spoiled beyond recovery by 5 deadening years at a dull court. She is too anxiously part of her life at court and too impressed by the idea of royalty, to use her experiences there as she used those of her youth. She becomes less interested and less interesting

—an amateur writer who never grows up. During her lifetime she was overestimated, but her work is still regarded as an invaluable link in the early hist. of fiction. The standard ed. of her *Diary and Letters* is by A. Dobson (6 vols.), 1904. See also A. Dobson, *Fanny Burney*, 1903; M. Massfield, *The Story of Fanny Burney*, 1927; C. Lloyd, *Fanny Burney*, 1936; Averyl Edwards, *Fanny Burney*, 1948.

Burnham, Edward Levy-Lawson, 1st Baron (1833-1916), b. London, son of Joseph Moses Levy, printer. Educ. at Univ. College School, he became dramatic critic to the *Sunday Times*, owned by his father, who in 1855 bought the newly estab. *Daily Telegraph and Courier*, dropped the last half of its title, and reorganised it. With Cobden and Bright B. agitated for removal of the newspaper duty, and on its abolition in 1861 the *Daily Telegraph* became extremely successful. Levy, who in 1862 had married a daughter of Benjamin Webster the actor, assumed by royal licence in 1875 the additional surname of Lawson under the will of his uncle Lionel Lawson. The direction of the *Daily Telegraph* came into his hands in 1885. On the appearance of Irish Home Rule on the Liberal programme in 1885 he and his paper adhered to the Unionist cause. He continued the paper's policy of helping exploring expeditions, was made a baronet in 1892, and was raised to the peerage and retired from control of the paper in favour of his son, the 1st Viscount B. (q.v.).

Burnham, Frederick Russell (1861-1944), Amer. scout, b. Tivoli, in the wilds of Minnesota; son of Rev. Edwin Russell. In 1893 he first visited S. Africa, and at once entered the service of the Brit. S. African Co., which was at war with the Matabele. In the second rebellion of the same tribe, he gained distinction by killing M'limo, the Kaffir high priest, who was the instigator of the revolt. In 1899 he served in the Boer war. In 1900 he was captured at Sanna's Post, where Broadwood's convoy was surrounded, but made good his escape. At one time he destroyed the railroad between Pretoria and Johannesburg, and his last achievement in that region was the destruction of the line E. of Pretoria, his object being to prevent the Brit. prisoners from being taken away. He was made chief of the scouts of the Brit. Army in the field, and received various decorations. He made surveys of the Volta R., W. Africa, 1902, and explored Congo basin, 1903-4. Made discoveries of Maya civilisation in Mexico, 1908.

Burnham, Harry Lawson Webster Levy-Lawson, 1st Viscount and 2nd Baron (1862-1933), b. London, son of the 1st Baron (q.v.). He was educ. at Eton and at Balliol College, Oxford. As a Liberal he represented W. St Pancras in Parliament, 1885-92; he was called to the Bar at the Inner Temple, 1891; and he was on the London Co. Council, 1889-92 and 1897-1904. He was in Parliament again, as member for Mile End (Tower Hamlets), 1905-6; and again for same constituency,

but as a Unionist, 1910-16. He was mayor of Stepney, 1908-9. In 1916 he succeeded to the barony, and was made a viscount in 1919. He presided at the International Labour Conferences at Geneva, 1921, 1922, and 1926. He was appointed a member of the Indian Statutory Commission, 1927. The 'Burnham award' as to schoolteachers' salaries is the work of a standing committee of which he was chairman. The *Daily Telegraph*, of which he had the management since 1903, and the proprietorship since 1916, he sold in 1927.

Burnham Beeches, wooded region of 515 ac. near Slough in Bucks, England. It is the remains of an ant. forest, and consists of a number of beeches of tremendous girth. Gray, in a letter to Walpole dated Sept. 1737, remarked on their picturesque beauty (*Gosse's Life of Gray*, 1882; Wm Mason's *Life of Gray*, 1774). In 1879 the City of London Corporation acquired them for public use. Burnham itself is a township of 5900 inhab.

Burnham-on-Sea, tn and urb. dist. in Somerset, England, on an estuary of the R. Parrot, with extensive sands, a light-house, hotels, and facilities for golf and tennis. Highbridge was amalgamated with B. in 1933. Pop. of dist. 9526.

Burnie, post tn and port of entry and clearance of Wellington co., Tasmania, on Emu Bay. It is 67 m. WNW. of Launceston, and the terminus of the railway to Waratah. Pop. 14,240.

Burning, see COMBUSTION.

Burning Bush, name given to *Dictamnus albus*, a perennial herb with glandular stem giving off a very volatile, fragrant oil which can be ignited on a hot, still day; to *Euonymus alatropurpureus*, a deciduous shrub with pale yellow foliage colour and crimson fruits in autumn; and *Kochia scoparia* var. *trichophila*, a half-hardy ann. turning purple-red in autumn.

Burning Glasses and Mirrors. A lens may be used to bring the heat-rays of the sun to a focus in the same manner, though not quite at the same point, as the rays of light are focused. The heat thus brought to bear on a small area is sometimes used for fusing metals, etc. The focusing may be produced by reflection from concave mirrors or a concave system of plane mirrors. In the 'solar engine' the heat reflected from sev. thousand plane mirrors arranged on a huge concave frame is focused upon a small boiler and utilised to drive an engine for pumping operations, etc. A special instrument, known as a heliostat, is provided to keep the apparatus facing the sun. Archimedes is said to have burnt the Rom. fleet of Marcellus before Syracuse by focusing the heat of the sun with sev. large burning mirrors. See LENS and REFLECTION.

Burnley, mrkt tn, municipal co. and parl. bor. of Lanes. It stands at the confluence of the Brun and Calder. Charles Towneley, whose collection of antique marbles and bronzes reposes in the Brit. Museum, was b. here. Besides

the staple trade, cotton spinning and weaving, there are sev. large machine and light engineering works, iron foundries, paper-mills, and a hardware factory. Towneley Hall is now a museum and art gallery. The Paulinus Cross is said to have been erected to commemorate the preaching of St. Paulinus in this dist. about AD 600. Pop. 83,290.

Burnouf, Eugène (1801-52), Fr. Sanskritist and Iranist. He gave up the legal profession to devote himself to oriental studies. In 1832 he was appointed prof. of Sanskrit at the Collège de France, Paris. He collaborated with Lassen and with Bopp. Main works: *Essai sur le Pâli* (with Lassen), 1826; *Vendidad Sade* (folio parts), 1829-43; *Commentary on Yasna*, 1833-45; *Observations sur la grammaire de M. Bopp*, 1834; *Études sur la langue et les textes Zendes*, 'Journal Asiatique', 1840-50; *Introduction à l'histoire du Bouddhisme Indien* (I, 1844; 2nd ed., 1876; II, 1862). He ed. and trans. *Bhāgavadapūrāṇa* (2 vols.), 1844. His works, though partly out of date, are still valuable.

Burnous (Arabic *burnus*), loose full cloak worn by Arabs, generally white, and with a hood resembling that of a Capuchin friar.

Burns, Eedson Louis Millard (1897-), Canadian general, b. Westminster, Quebec. He attended the Royal Military College, Kingston, Ontario, and after graduation was commissioned in the Royal Canadian Engineers (1915). By the end of the First World War he had reached the rank of captain. B. attended the Imperial Defence College in England at the commencement of the Second World War. He stayed in London to assist with the reception of the Canadian troops arriving in Britain. In 1943 he was promoted major-general, in command of the 2nd Canadian Infantry Div. In 1944, as acting lieutenant-general, he commanded the 1st Canadian Corps in Italy. After the war he held sev. administrative appointments in Canada, but in 1954 he was appointed to take charge of the U.N. Truce Supervision Organisation in Palestine. In 1956 he was given command of the U.N. Emergency Force sent to take over from the Anglo-Fr. forces which had been engaged in the military operations in the Suez Canal zone and the Israeli forces which occupied Sinai and Gaza. B. is an authority on cartography and allied technical subjects.

Burns, Jabez (1805-76), nonconformist divine, educ. at Chester and Oldham Grammar School. While a boy he joined Methodist New Connexion; 1826 came to London; compiled *Christian's Sketch-Book*, 1828 (second series issued 1835); *Spiritual Cabinet*, 1829. B. did much mission work on behalf of Scottish Baptists, becoming pastor of a Perth congregation, 1830-5; 1835, pastor to Baptist congregation at Marylebone. He was said to have been the first clergyman to preach teetotalism from the pulpit. He delivered 35 ann. temperance sermons, beginning Dec. 1839. Member of the Evangelical Alliance, formed 1845; after

1847 travelled in America, Egypt, and Palestine. Among his works are *Notes of a Tour in U.S.A. and Canada in 1847*, 1848, *Helpbook for Travellers to the East*, 1870, *The Golden Pot of Manna, or Christian's Portion*, 1848, *Preacher's Magazine and Pastor's Monthly Journal*, 1839-44, and *Sermons*, 1842.

Burns, James (1808-71), Brit. publisher, founder of Burns & Oates, publishers to the Holy See in Great Britain. He was the second son of the Reverend Wm Hamilton Burns, D.D., and was descended on both sides from a long line of Presbyterian ministers. Educ. in Glasgow for the same career, in 1832 he went S. and found work with a London publisher, setting up on his own 3 years later. He had by this time become a follower of the High Church movement, which, in the late forties, led him to Rome. Conversion was followed by a lean period, selling music and church furniture as well as books, which ended in 1848, when Newman gave him *Loss and Gain*. Other works by Newman followed—including *The Dream of Gerontius*—and B. rapidly attracted other leading Catholic authors to his list. In this way the firm he founded became one of the best-known Rom. Catholic imprints in the Eng.-speaking world.

Burns, John (1858-1943), politician, b. Vauxhall, London. He received his educ. to the age of ten at a national school; then he was sent to work, but continued study at night schools. He worked at first in a candle factory, and was later apprenticed to an engineer, and became a Socialist. He worked at his trade on land and on board ship, and went for a year to W. Africa. He had in the meantime become known as a labour agitator. In 1886 he cleared himself of the charge of instigating the mob to violence on the occasion when the clubs of the W. End had their windows broken. In the following year, however, he suffered 6 weeks' imprisonment for his share in the Trafalgar Square riots. In 1885 he had been unsuccessful as the candidate of the Social Democratic Federation at W. Nottingham. He sat on London's first co-council as a Progressive member for Battersea, and in 1892 as the candidate put forward by a local 'Labour League,' he became member of Parliament for the same constituency, a seat he retained until 1918. He was active in securing good conditions of employment both in the L.C.C. service itself and in the undertakings of its contractors. The 'fair wages clause,' which became general in local gov., owes much to B. In 1889 he had, together with Ben Tillett, been the chief organiser of the London dock strike. He was made president of the Local Gov. Board in Campbell-Bannerman's administration, 1906, being the first working-man to attain Cabinet rank, and became a Privy Councillor. By that time he had lost much of his popularity with the Socialist rank and file—partly on account of his having taken office with the Liberals, partly on account of the Puritan bluntness with which he rebuked the

failings of his own class. He took an active share in social legislation during his period of office, introducing the House and Town Planning Bill in 1909. On the declaration of war, Aug. 1914, he was one of the 3 ministers who immediately resigned. He never joined the rising Labour party, and retired into private life towards the end of the First World War, rather than stand for the general election of Dec. 1918. A vigorous rather than a polished orator, he had command of apt citation and of epigram, if at times bordering on magniloquence.

Burns, Robert (1759-96), poet, *b.* Alloway, near Ayr, in a cottage built by his father, a farmer who had migrated from Kincardineshire and who originally spelt his name Burnes. The careful instruction that B. got from him and from John Murdoch, the village schoolmaster, disposes of the theory that he was inspired but illiterate. From his mother Agnes Brown he learned a wealth of traditional ballads and folk-tales. But he was put early to work. His father, who was constantly trying to better his position but seemed fated to be unfortunate, took a farm in 1768 at Mount Oliphant, and in 1777 moved to Lochlea in the par. of Tarbolton. At 15 B. was a skilled ploughman. Meanwhile he had some additional though intermittent schooling, and when Murdoch was estab. in Ayr made shift to learn from him the rudiments of French. His first song, 'Handsome Nell,' was written when he was 16, inspired by a young partner at the harvesting. About this time he attended a country dancing school, against his father's wishes, and soon after began the succession of love affairs which has made him notorious. In a brief visit to a school at Kirkoswald he learned surveying and also to take his glass, and in 1781, despairing of farming, he went to Irvine to learn the trade of flax-dressing, but that project fell through when the shop was burned down during a Hogmanay carousal. Finally, in 1784, when his father d. of consumption, Robert and his brother Gilbert invested what little capital could be saved in the farm of Mossiel near Mauchline.

Mossiel proved no more successful than their other ventures, and meanwhile B. had formed a union with Jean Armour, daughter of a master mason, but owing to separation following a quarrel with her family considered himself free again and purposed, as a desperate bid for fortune, to emigrate to Jamaica as book-keeper on a plantation. To this time belongs the romance of 'Highland Mary' mentioned in his poems, whose statue stands at Dunoon; B. intended that Mary Campbell should accompany him to Jamaica as his wife, but meanwhile she d. of fever, and his fortunes took a turn which entirely changed his plans. It was to get money for his passage that he pub. his *Poems Chiefly in the Scottish Dialect*, 1786 (the famous 'Kilmarnock Burns'), which was an immediate success. It contained much of his best work, including 'The Two Dogs,' 'Hallowe'en,' 'The Jolly Beggars,' 'To a Mouse,' 'To a Mountain

Daisy,' and that idyll of a Scottish fireside, 'The Cotter's Saturday Night.' On seeing the collection Dr Thomas Blacklock (q.v.) dissuaded B. from going abroad, and arrangements were made for an Edinburgh ed. of the poems, which eventually brought him some £500. In Edinburgh B. was received as an equal by Dugald Stewart the philosopher, Wm Robertson the historian, and Hugh Blair the poet, as well as by aristocrats like the Earl of Glencairn. Always a good conversationalist, he made a favourable impression by his frankness and modesty, forming friendships with, among others,



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Mrs McLehose, the 'Clarinda' of his letters, and Mrs Dunlop of Dunlop, with whom also he corresponded for a time. Walter Scott, then a boy of 15, saw him and described him later as 'of manners rustic, not clownish' . . . 'the eye alone indicated the poetical character and temperament. It was large and of a dark cast, and literally glowed when he spoke with feeling or interest.' Back in Ayrshire in 1788 B. acknowledged Jean Armour as his lawful wife, used his capital to try a new farm, Ellisland, on the banks of the Nith near Dumfries, and took lessons in the duties of exciseman as a line to fall back upon if farming should again prove unsuccessful.

At Ellisland he was cultivated by the local gentry, and it was suggested that he should be a candidate for the newly founded Chair of Agriculture at Edinburgh Univ., but he declined. The farm proving a poor bargain, like the others, in 1791 he removed to Dumfries and became a gauger or exciseman pure and

simple. Unhappily the advantages of a steady income were partly offset by the opportunities for hard drinking, which had long been his weakness. Meanwhile he was engaged in one of his most important literary tasks, the provision of songs for the *Scots Musical Museum* compiled by James Johnson, and also for George Thomson's *Select Collection of Original Scottish Airs*. B.'s contribution of over 200 songs, many of his own composition, many based on older verses which he refurbished and revitalised by his genius, is perhaps his supreme achievement. It was entirely a labour of love, for he received no payment whatever. At this time also he wrote in one day what is reckoned the greatest of his longer poems, the rollicking 'Tam o' Shanter.' His work in the Excise was satisfactory, and he could look forward confidently to a superintendence. His prospects had never been brighter when in 1796 he paid the final penalty of his intemperate habits, an attack of rheumatism bringing on endocarditis, to which he succumbed. Ever since his death B. has suffered from well-meaning but illogical critics who think it necessary to deplore or explain away his frailties before pointing out the greatness of his genius. As the critic Gregory Smith observes sarcastically, 'the comment on intrigue and whisky rolls on, involving us all in irrelevance.' The simple facts, from a literary point of view, are that B. was not only the finest Scottish poet but one of the greatest of all writers of love songs. Whether composing original pieces or, as in the case of 'Auld Lang Syne,' revitalising a song which had already passed through more than one version, he had the sure touch of lyric genius. To this he added a power of vitriolic satire shown in such poems as 'Holy Willie's Prayer,' and a command of vivid description that appears at its best in 'Tam o' Shanter' and 'The Jolly Beggars.' His poetry owed much to Allan Ramsay and to ill-starred Robert Ferguson, who stands in much the same relation to B. as Marlowe does to Shakespeare, but he far surpassed both his Scottish forerunners, and the example of his work was one of the vital influences in the coming Romantic Movement.

The first ed. of his collected works was that of J. Currie, 1800, others are by A. Cunningham, 1834, W. S. Douglas, 1877-9, and R. Chalmers and W. Wallace, 1896; his poems were ed. by W. E. Henley and T. F. Henderson, 1896-7, A. Lang and W. A. Craigie, 1896; his letters by J. de L. Ferguson, 1931. See lives by J. G. Lockhart, 1828, J. C. Sharp, 1897, A. Baker, 1923, C. Carswell, 1930, F. B. Snyder, 1932, D. Daiches, 1952; essays by T. Carlyle, 1839, and R. L. Stevenson, 1882.

Burns and Scalds, destruction of tissue by dry heat in the former case, by moist heat in the latter; the general symptoms and treatment are the same in both cases. B. are usually classified according to the depth to which the tissues are affected. Dupuytren suggested the following degrees: (1) Where the skin is reddened. A slight

swelling is apparent which usually disappears quickly; there is considerable pain at first, but the condition is rapidly cured. (2) Where the outer skin is destroyed, more or less extensive blisters containing serum raising it from the true skin. A fair amount of pain is felt; the outer skin is cast off after the blister has been pierced, and a new skin forms without any scar remaining. (3) Where the true skin is partly destroyed. The pain is considerable, black or brownish sloughs occur, and there is danger of septic poisoning. When the wound has healed, a slight scar or puckering of the skin is observable. (4) Where the true skin is wholly destroyed. The condition is serious, but is not accompanied by much pain, as the nerve-endings have been destroyed. After healing, a deep scar can be noticed. (5) Where the soft parts, muscles, etc., have been destroyed. (6) Where the bones have been charred, a very serious condition, which can usually only be met by amputation. The dangers from B. include shock, septic poisoning, inflammation of internal organs, and general exhaustion. The danger from shock depends upon the extent of the burnt area; it is estimated that cases in which over one-third of the total body-surface is seriously affected end fatally. The whole nervous system has reacted very rapidly and with great intensity, and cannot undergo repair sufficiently to keep the organism alive. The result is coma, leading to death. The danger of sepsis arises from the fact that the tissues beneath the skin have been laid open to the action of micro-organisms in the atmosphere. The extent to which the tissues have been laid bare determines the extent of the danger. Complications with respect to underlying or other organs may arise through the loss of the skin's functions, the disturbance of the blood supply, and the possible introduction of germs peculiarly harmful to those organs. Exhaustion of the system is a natural result of the strain occasioned by the healing process and interference with the nutritive functions, as in cases of scalds of the throat and stomach. The symptom demanding most immediate treatment is shock. Vitality should be preserved by wrapping the patient in blankets, placing hot-water-bottles at the extremities, and administering stimulants. The condition of shock lasts from thirty-six to forty-eight hours. Local treatment of B. aims at preventing infection, relieving pain, and promoting healing with a minimum of deformity or scarring. If the burn be slight, the blisters may be pierced, their contents drained off, the outer skin cut off and the surface treated with a weak solution of picric acid. In dealing with severe B., care must be taken not to tear affected tissues by rough handling of clothing. The clothes should be carefully cut off, the whole surface should be treated with an antiseptic, and then the more permanent dressing adjusted. This usually consists of gauze soaked in picric acid solution and covered by antiseptic wool, the whole being lightly bandaged, so as

to exclude all air, but without undue pressure upon the injured part. Two affected surfaces must not be left in contact, as the result might be a union of the two surfaces. In cases where the destruction of the true skin has been extensive, skin-grafting has been adopted with satisfactory results. An aqueous solution of tannic acid (10 per cent) has been used for the treatment of B. with the object of forming a protective surface; moreover, by promoting coagulation it helps to prevent the absorption of toxic materials produced by burnt tissues. It may, however, conceal the onset of sepsis; it is also liable to cause contraction and loss of function. Gentian violet (1 per cent aqueous solution) has also been used with success. Irrigation of the affected part with warm saline in the Bunyan-Stannard envelope is another method giving good results. Absorbed toxins cause damage to the cortex of the suprarenal bodies, which can be counteracted by injections of cortical extract, or preferably of synthetic corticosterone; the liver lobules are also affected adversely, calling for administration of glucose. Blood transfusions are often given to counteract shock and toxæmia. Sulphonamides and penicillin are useful in cases of severe infection.

Burnside, Ambrose Everett (1824-81), Amer. soldier, a native of Liberty, Indiana. He became a member of the Military Academy but resigned his commission in 1853 and adopted the manu. of firearms. Three years later he invented a breech-loading rifle. He took a prominent part in the first battle of Bull Run, and was appointed brigadier-general of volunteers in 1861. He sailed in the following year for the N. Carolina coast, and in the ensuing campaign won the victories of Roanoke, Newbern, and Fort Macon. Shortly afterwards he was made major-general, U.S.V. President Lincoln appointed him to succeed Maclellan to the army of the Potomac. He was thoroughly defeated at Fredericksburg in 1862, and aroused much criticism by his suppression of press opinion. The failure of the 'Burnside mine' at Petersburg (q.v.) caused his resignation in 1864. In 1866 he became governor of Rhode Is. He was a Republican member of the Congress till his death. He d. at Bristol, Rhode Is. See B. P. Poore, *Life*, 1882.

Burnside, Helen Marion (1844-1923), artist and poet, exhibited at the Royal Academy in 1863. From 1880 to 1889 she was designer at the Royal School of Art Needlework. For the next 5 years she was editor to Messrs Raphael Tuck. She also wrote many songs and magazine stories, but she is known more especially as the writer of children's books.

Burnside, suburb of Adelaide (q.v.), S. Australia. Pop. 28,000.

Burnt-ear, common name for a disease of corn caused by minute fungi. The seed-coat of the grain attacked is covered with a black dust, while the interior seems to be untouched, but is found to be abortive. See SMUT.

Burnt Sienna, see SIENNA.

Burnt Stones, old cornelians possessing a glowing red colour when held to the light. They are found in ruins and have a dull appearance externally.

Burntisland, burgh, seaport and holiday resort on the Firth of Forth, Fifeshire, Scotland, Rossend Castle is here, built 1119. The influence of the close intercourse which once existed between B. and Holland is expressed in the par. church, which resembles the N. Church, Amsterdam. It was here that James I pressed his proposals for a new trans. of the Scriptures into English. There are ship-building and aluminium processing industries. Pop. 5670 (burgh; pop. of par. 5883).

Burr, Aaron (1756-1836), Amer. legislator and native of New Jersey. At the College of New Jersey, now Princeton Univ., where his father and grandfather had occupied the presidency, he graduated. He joined the patriot army in 1775, and two years later was rewarded for his valour and abilities by promotion to lieutenant-colonel. He resigned in 1779, and was called to the Bar, where he quickly assumed a prominent position. From 1789 to 1790 he was state attorney-general; senator (1791-7); and vice-president (1801-5). He fought a duel with Alexander Hamilton, who was responsible for his defeat in obtaining the governorship of New York, and killed him. Flight to the S. was necessary till the excitement lessened, when he returned. An attempt to raise revolution in Texas in order to establish a rep. there resulted in his arrest. He was acquitted of charges of treason, but was socially ostracised. After spending some time abroad, he returned to the practice of law in New York, made an unhappy second marriage, and suffered from financial difficulties. He d. on Staten Is.

Burr, William Hubert (1851-1934), Amer. engineer, b. Watertown, Connecticut. He became prof. of engineering at Harvard Univ. in 1892, and at Columbia Univ. in 1893. In 1899 he was appointed a member of the Isthmian Canal Commission to report upon a route for the Panama Canal; in 1904 of the commission to construct the canal; in 1905 of the international board of consulting engineers to determine the plan of the canal; and in 1919 of the board of consulting engineers for constructing a vehicular tunnel under the Hudson R. at New York city. Pubs.: *The Stresses in Bridge and Roof Trusses*, 1881; *Elasticity and Resistance of the Materials of Engineering*, 1883; *Ancient and Modern Engineering and the Isthmian Canal*, 1902; *Suspension Bridges, Arch Ribs, and Cantilevers*, 1913.

Burra, see KOORINGA.

Burra-Burra, celebrated copper mine in S. Australia, 101 m. N. by E. of Adelaide. Ore to the value of £4,000,000 has been mined, but the mine is now closed.

Burrard Inlet, narrow inlet of Brit. Columbia, situated at the SW. extremity. It forms a magnificent harbour, and is the inlet on which stands Vancouver,

the W. terminus of the Canadian Pacific Railway.

Burren, see CLARE.

Burriana, Sp. tn in the prov. of Castellón de la Plana, on the Mediterranean coast. It has a trade in oranges, oil, and wine. Pop. 16,000.

Burritt, Elihu (1810-79), Amer. philanthropist, commonly called 'the learned blacksmith.' He was a native of New Britain, Connecticut. His grandfather and father had served in the revolutionary army. His education was self-obtained from whatever books were available at home. He became apprenticed to a smith at the age of 16, and adopted smith work as his trade. He was able to indulge a passion for literature in any form in his spare moments at the forge, while for a short time he attended a school kept by his brother Elijah. In this desultory fashion he conquered Latin, Greek, French, Spanish, and German, and by the time he was 30 years of age could read nearly 50 languages. He gradually acquired fame with his increasing store of knowledge, and soon embarked upon a lecture tour to various places in U.S.A. and Europe on behalf of peace. He organised in 1846, while in England, the League of Universal Brotherhood. He organised the Brussels Peace Conference (1848), and similar conclaves held at Paris, Frankfurt on the Main, and other cities, and pub. innumerable pamphlets. He founded the *Christian Citizen* at Worcester to advance his views. He returned to America and d. at New Britain.

Burroughs, Edgar Rice (1875-1950), Amer. novelist, b. Chicago. He was educ. at Michigan Military Academy, enlisted but was discharged as under age, and for 15 years followed various occupations—drover, gold dredger, railway detective—till, in 1912, he wrote *Tarzan of the Apes*, the story of a boy who was brought up by monkeys. Its success was tremendous, over 25 million copies of it and its sequels being sold. There are about a dozen volumes in the series, including *The Return of Tarzan*, 1915, *The Beasts of Tarzan*, 1917, *Tarzan the Terrible*, 1921, *Tarzan the Invincible*, 1931, and *Tarzan the Magnificent*, 1939. B. also wrote a series of romances about other planets, including *A Princess of Mars*, 1917, *The Warlord of Mars*, 1919, *Lost on Venus*, 1935, and *Synthetic Men of Mars*, 1940.

Burroughs, John (1837-1921), Amer. nature-writer, b. Roxbury, New York state. Among his early callings were teaching, journalism, and farming. In the treasury dept. of Washington he served as a clerk for 9 years. His early productions included *Wake-Robin*, 1871, *Birds and Poets*, 1877, *Locusts and Wild Honey*, 1879, and *Fresh Fields* (on a visit to England), 1885, in prose; while in verse he pub. a vol. called *Bird and Bough*, 1905. Other works include *Whitman: a Study*, 1902, *Ways of Nature*, 1905, *The Summit of the Years*, 1913, *The Breath of Life*, 1915, *Under the Apple Trees*, 1916, *Field and Study*, 1919,

and *Birds and Bees*, 1926. See Clara Barrus, *Life and Letters of John Burroughs*, 1925, and C. H. Osborne, *The Religion of John Burroughs*, 1930.

Burrows, S., see BOROUGH STEPHEN.

Burrowing Owl, or *Speotyto cunicularia*, is a native of America. It is about 9 in. long, has no ear-tufts, and its legs are long and poorly feathered. It inhabits burrows and holes of caves, lizards, foxes, squirrels, and other animals, and there it makes its nest.

Burrows, Ronald Montagu (1867-1920), archaeologist, b. Rugby, and educ. at the Charterhouse and Christ Church, Oxford. While assistant to Prof. Gilbert Murray in the Gk dept. of Glasgow Univ., 1891-1897, he excavated at Pylos at the SW. extremity of the mainland of Greece, and in the adjoining is. of Sphakteria, 1895-1896; and the results, described in *Hellenic Studies*, cleared the credit of Thucydides as a historian. In 1907 he pub. *The Discoveries in Crete and their Bearing on Ancient Civilisation*. In 1908 he became prof. of Greek at Manchester Univ. He was appointed principal of King's College, London, in 1913.

Burrstone, see BURSTONE.

Burrus, Sextus Afranius, native of Gaul, appointed praetorian prefect by Claudius in AD 52. With Seneca he was joint tutor to Nero, whose succession he helped to secure. To B.'s influence was due the brilliance of Nero's early reign, but he quarrelled with the emperor and d. in AD 63. Most historians allege that he was poisoned by Nero, though Tacitus entertained some doubt.

Burry Port, urb. dist. and seaport on B. estuary, Carmarthenshire, Wales, 4 m. W. of Llanelly. Pop. 8000.

Bursa, il of Asiatic Turkey and tn of same name. The tn is situated close to the base of Mt. Oly

in a wooded fertile valley. sulphur springs in the neighbourhood. In 1855 a terrible earthquake occurred which disfigured the tn very greatly. B. is especially noted for the manu. of carpets, tapestry, silk fabrics, gauze, and satins, and the demand for these is considerable in E. countries, though the people of Switzerland make many imitations in cotton. Wine is another production. Pop. (II) 613,363; (tn) 131,336.

Bursae, synovial sac or closed space containing liquid between two moving surfaces of the body. Its function is to lessen the effects of friction, and bursae may either be permanently situated for that end, or developed in a part where friction has caused a certain amount of irritation of the tissues. Bursae may be classified as (1) bursae between the covering skin and bony projections, as at the point of the elbow and at the knee-cap; (2) bursae between tendons and the surfaces they cross; (3) bursae between tendons and the walls of osteofascial tunnels.

Bursar, term used at Oxford and Cambridge colleges for the official who keeps the college accounts. It is also used in the same sense in public schools, and in 1932 an association of these

officials was founded. His office is called the bursary. This latter word is used in Scotland to denote a grant of money to be made to a student, the equivalent of a scholarship or exhibition in England.

Bursaria is a genus of ciliate Protozoa of large size, in which the body appears to be convex above and concave below. Lamarek described 5 species of these freshwater creatures, of which *B. truncatella* was one.

Burschenschaft, name of an association of students of the univ. of Germany, founded in Jena in 1815. It owed its inspiration to the national sentiment aroused in Germany by the war of Liberation and its object was to encourage and engender patriotism and a Christian bearing. Its chief patron was the Grand-Duke of Saxe-Weimar. It took a prominent part in the revolutions of 1830 despite the provisions of the Carlsbad decrees, which, however, in 1833 secured its suppression. It was resuscitated in 1848, but gradually lost its political character. The B. is now extinct. See G. Heer, *Geschichte der Burschenschaft*, 1927-9.

Burseraeae, family of dicotyledonous plants which are found in the tropics, and yield balsam, resin, and gum. The flowers are small and regular, with the disk usually annular, in parts of 4 or 5, with a syncarpous gynoecium consisting of 3 to 5 carpels, with 2 ovules in each loculus. The fruit is a drupe or a capsule, and the bast contains resin passages. Genera include *Amyris*, *Boswellia*, *Bursera*, *Commiphora*, *Garuga*, and *Protium*.

Bursitis, inflammation of a bursa (q.v.). Usually chronic and caused by the irritation from constant pressure or friction—as in 'housemaid's knee'—B. may be acute and purulent. In B. an excess of serous fluid is secreted by the walls of the bursa, which becomes distended and tense. B. may follow a blow to the bursa, in which case the swelling is haemorrhagic instead of serous. B. is not serious and usually responds to aspiration of the fluid and avoidance of the kind of usage of the joint to which it was formerly subjected. For example, those with B. of the knee should either avoid kneeling or wear a kneeling pad. In purulent B. the abscess must be drained. B. which becomes infected do not as a rule recur as the cavity of the bursa becomes obliterated by fibrous adhesions.

Buralem, former bor. and mrkt tn of Staffs, England, since 1910 included in the co. bor. of Stoke-on-Trent (q.v.), of which it forms 5 wards. In the 17th cent. it was the chief Eng. centre for the manuf. of earthenware and is still called the 'mother of the potteries.' Josiah Wedgwood was b. here (1730); the Wedgwood Memorial Institute was opened by the Marquess of Ripon in 1869. The B. and Tunstall War Memorial Hospital (the Hayward) commemorates the victims of the First World War.

Burton, Decimus, F.R.S. (1800-81), architect, was the son of a builder by whom he was trained. He then entered

the R.A. schools to study architecture, started practice at an early age, was befriended by John Nash (q.v.), and ultimately became a leading figure in the Classical Revival, although he had not studied in Italy or Greece. His enormous London practice included the Athenaeum Club, his masterpiece, 1827; the screen at Hyde Park Corner, and the arch now on Constitution Hill; Charing Cross Hospital, 1831-4; and, in Regent's Park, the Holme, c. 1818; Grove House, 1822-4; St Dunstan's Lodge, 1825; Holford House, 1832-1833. Outside London, besides a very long list of country mansions, he laid out the Calverley Estate at Tunbridge Wells, 1828 onwards; other suburban estates at Liverpool, Fleetwood, Glasgow, Folkestone, etc.; and Adelaide Crescent at Brighton, 1830-4.

Burton, Sir Frederick William (1816-1900), painter, b. co. Clare. Elected associate of Royal Hibernian Academy when only 21 years of age. In 1842 he began to exhibit at the Royal Academy. He travelled widely in Europe, where he gained an intimate knowledge of the works of the old masters. In 1874 he was appointed director of the Brit. National Gallery.

Burton, John Hill (1809-81), historian, b. Aberdeen. He graduated at Aberdeen Univ., and was called to the Bar. His practice was not large, and he had to devote himself to literature, contributing to sev. periodicals and encyclopaedias. In 1846 he achieved great distinction with his biography of David Hume, and in 1847 produced biographies of Simon Lord Lovat and Duncan Forbes. In 1854 he was appointed secretary to the prison board of Scotland, and became a prison commissioner. He held office as historiographer royal for Scotland. His other works include *History of Scotland from Agricola's Invasion to 1688*, 1867-70 and 1873.

Burton, Sir Richard Francis (1821-90), explorer, b. Barham House, Herts. He spent most of his childhood in Italy and France. He was educ. at Trinity College, Oxford, and entered the Indian Army in 1842. During his stay in India he studied assiduously the various oriental languages, and rapidly reached proficiency. He was appointed assistant in the Sind survey, which enabled him to mix with the people. He frequently passed as a native in the bazaars, and thus gained an excellent knowledge of E. life and customs. On his return home he pub. an important work on Sind, together with 3 other books. In 1853 he made a pilgrimage to Mecca, which was to make him famous. He went disguised as an Indian Pathan. The book he wrote, called *Pilgrimage to El-Medinah and Meccah*, 1855-6, contains a most interesting account of his journey and exploits. His next journey was into the Somali country in E. Africa. He went to Harar, the Somali cap., which had hitherto never been entered by a white man, and stayed there 4 days. Afterwards he vanished into the desert, and nothing was heard of him for 4 months. He next served on Gen. Beaton's staff in

the Crimea. In 1856 he went with Speke to Africa, and explored the lake regions of equatorial Africa. They discovered Lake Tanganyika in 1858, and Speke, during B.'s illness, discovered Victoria Nyanza. In 1861 B. was made consul of Fernando Po, whence he was shifted successively to Santos in Brazil, Damascus, and Trieste, which post he held till his death. B. married Isabel Arundell in 1861, and she accompanied him henceforth on all his journeys. He received the gold medal of both Fr. and Eng. geographical societies. He was master of 35 languages and dialects. He was knighted in 1868.



SIR RICHARD BURTON

He wrote numerous books, chief of which are *First Footsteps in East Africa: Harar*, 1856, *Abeokuta and the Cameroon Mountains*, 1863, *Wanderings in West Africa*, 1863, *Explorations of the Highlands of Brazil*, 1869, and *Gold Mines of Midian and the Ruined Midianite Cities*, 1878. His chief work is his trans., with copious notes, of the *Arabian Nights*, 1885-8. He also trans. *The Lusiads* of Camoens, 1881. His wife built an Arab tent of stone and marble to his memory at Mortlake. See lives by Lady Burton, 1893; T. Wright, 1906; W. P. Dodge, 1907.

Burton, Robert (1577-1640), Eng. humanist and writer, famous for *The Anatomy of Melancholy*, b. Lindley Hall in Leics, the fourth of a family of 9. He received his education at the free school at Sutton Coldfield and at Nuneaton Grammar School, and in 1593 entered Brasenose College, Oxford. In 1599 he was elected a student at Christ Church, where he spent the remainder of his life. In 1616 he became vicar of St Thomas's and in 1630 rector of Seagrave in Leics, through the patronage of George, Lord Berkeley. He held both livings until his death. Some years previous to his death he predicted its occurrence in his sixty-second year by

a calculation of his nativity. In appearance he was a thick-set, plumpish man, with dark brown beard of formal cut, a satiric glint in his large eyes, and a monumental forehead revealing intelligence and memory. In 1606 he wrote a Lat. comedy called *Philosophaster*, and rewrote it in 1615. It was acted by students in 1617; it was then for some considerable time lost, but was rediscovered in 1862. His book, *The Anatomy of Melancholy*, appeared in 1621, and the author signed himself Democritus Junior. In his very extensive preface he refers to the influence of Democritus and Hippocrates upon his proposed work, and also gives his reasons for writing it. In the book itself he first defines melancholy, and divides it up into its various kinds. He proceeds then to examine the causes of melancholy, and then goes on to give the methods by which it may be cured. The concluding section of the work deals with religious melancholy. B. had no intention of compiling a doleful work. He was a good-humoured pessimist. He is indeed somewhat of a paradox and not quite consistent. It is the most sententious book ever written, yet it reads trippingly as a novel. It is packed with common sense and uncommon nonsense. He mixes facetiae with theology, is most frivolous when most earnest, and, when colloquial, is most profound. He was first and last a bookman and his treatise is the legitimate offspring of a bookish mind, and although it is largely a distillation of authors it is an original work' (Holbrook Jackson). Sir Wm Osler described the *Anatomy* as 'the greatest medical treatise written by a layman,' but apart from the main theme there are sections which, although organically related to it, are complete essays in themselves. The curious learning found in *Tristram Shandy* had been pilfered from this book, and it was Perrier's ed. of *Tristram Shandy*, in which he pointed out Sterne's unacknowledged obligation to Burton, which drew attention once more to this almost forgotten book. There were sev. revised eds. of the *Anatomy* in the author's lifetime. Later eds. are those of A. B. Shilleto, 1893, 1925, F. Dell and P. Jordan-Smith, 1927, 1930, and H. Jackson, 1932. An Eng. trans. of *Philosophaster*, including B.'s minor writings in prose and verse, was pub. by P. Jordan-Smith in 1931.

Burton-in-Kendal, tn and par. of Westmorland, England, at the extreme S. of the co., near the estuary of the R. Kent and Bela. In mediæval times it was an important corn market for Yorks and the Fylde dist.; formerly iron ore was mined, but was worked out some 40 years ago. Pop. 700.

Burton upon Trent, co. bor. in E. Staffs, England, situated on the R. Trent and Trent-Mersey Canal, WSW. of Derby. Area 4222 ac. It is a town rich in historical associations and was formerly the seat of a Saxon abbey. In 1801 the pop. was 3679; fifty years later it was 6374, and to-day it has grown to nearly 50,000. The opening of the Midland

Railway in 1839 played a great part in the town's development. B.'s staple industry, brewing, can be traced back to the monks of B. Abbey, which was founded in 1002. The earliest known reference to B. ale was in 1295, and it was known in London in 1630. Although brewing and its allied trades stand unchallenged as the leading local industry, many important manufacturing concerns have been estab. in the town, including sev. nationally known firms. The tn hall was presented to the tn by Lord Burton, K.C.V.O., in 1894, a modern extension being opened in 1939. The corporation owns baths, omnibuses, markets, a library, over 2335 dwellings, extensive riverside walks, recreation grounds, tennis courts, allotments, a cemetery, a sewage farm, and 2 motor parks. B. is a quarter-sessions bor., and for parl. purposes is in the B. div. of Stafford. Pop. 49,170.

Buru, or **Boeroe**, Island, Is. of Indonesia, between the Coraen Sea (N.) and the Banda Sea (S.). Area 3700 sq. m. The surface is mountainous and the seaboard marshy. Most of the land surface is covered with forests and prairies. Exports are cajeput oil and timber. The inhab. are chiefly Malays on the coast, and Chinese and other races in the interior. Chief tn, Namlea. Conquered by Dutch in 1658. B. I. became part of Indonesia in 1950. Pop. about 19,000.

Burujird, see **BORUJERD**.

Burwood, suburban municipality of Sydney (q.v.), New S. Wales, Australia. Pop. 31,040.

Bury, John Bagnall (1861-1927), historian, b. in co. Monaghan and educ. at Trinity College, Dublin; became prof. of modern hist. at Dublin in 1893, regius prof. of Greek in 1898, and regius prof. of modern hist. at Cambridge in 1902. His works included an ed. of Gibbon's *Decline and Fall* (1896-1900), which has become the standard ed.; eds. of Pindar's *Nemean and Isthmian Odes*, 1890 and 1892; *History of Greece*, 1900; and sev. works dealing with the later Rom. Empire—bringing the hist. to Justinian.

Bury, Richard de, see **AUNGERVILLE**.

Bury, co. and parl. bor., is situated 9 m. N. of Manchester in the co. of Lancs, England. It is 195 m. NW. of London. Area 7434 ac.; pop. 58,829. The tn is situated on an eminence between the R.s Irwell and Roch, and has a mean elevation of about 300 ft above sea level. The coat of arms depicts 4 industries: cotton, woollen, engineering, and paper-making. In addition, there is a large variety of industry in the tn, including bleaching, calico-printing, dyeing, iron and brass founding, felt manufacturing, hatting, boot- and shoe-making, and manufacturing of clothing. There are 4 large and sev. small recreation grounds. It has a new tn hall. There are 2 direct grant grammar schools, a secondary grammar school, junior technical school, technical college, and school of arts and crafts. The depot of the Lancashire Fusiliers is in B. Two natives of B., Sir Robert Peel, 3 times Prime Minister of England, and John Kay, the

inventor of the fly-shuttle, are honoured by statutes.

Bury St Edmunds. Municipal bor. and mrkt tn of Suffolk, England, 27 m. E. of Cambridge. It owes its early importance to its famous abbey, which was built to contain the shrine of St Edmund, King of E. Anglia, who was martyred in 870. Of the monastery there are some remains of the abbey church, 510 ft long, the chapter-house, 2 gatehouses, and a bridge. The grammar school was re-founded in 1550 by Edward VI. Within the abbey precincts are the 2 great 15th-cent. churches of St Mary, one of the largest in England, and St James, nearly as large as St Mary's, which was constituted the cathedral of the diocese of St Edmundsbury and Ipswich, founded in 1914. Here were born Bishop Gardiner (c. 1483-1555), and Bishop Blomfield of London (1786-1857), and also Sir Nicholas Bacon, the eminent lawyer. Culford School, 5 m. N., is a public school for boys founded in 1881 and transferred there in 1935. The prin. industries are brewing and the manuf. of agric. implements. It is the depot of the Suffolk Regiment. Pop. 20,200 (estimated).

Buryat Mongolia, autonomous Soviet Socialist rep. of R.S.F.S.R., situated S. of the Yakutsk rep., in E. Siberia. It occupies a stretch of country along the frontier between the Soviet Union and the Mongolian People's Rep. to the W. of the S. end of Lake Baykal and extends northward between the E. shores of the lake and the Yablonovyy Mts, and also along the W. shores (excepting the area round Yakutsk). The coniferous forests which are so universal a feature of E. Siberia are in B. M. confined to the N. part of that country. In the S. they are interrupted by plateau and steppe vegetation, the home previously of Buryats and Mongols who were almost exclusively nomadic stock-breeders and fishers. Under the Soviet regime a more settled life has replaced the nomadic. Large numbers of the people have joined the *kolkhozy* or collective farms and now dwell in vil. settlements of wooden houses. Even the nomadic herdsmen are organised in 'collective' farms, each of which has great numbers of cows, sheep, horses, and goats. Some of the Buryats and Mongols are fox and squirrel trappers. A state farm has been estab. for sable breeding. Lumbering is also carried on in the forests.

The Buryats early came under the influence of Mongol culture and language and, together with the Mongols, offered a strong resistance to the Russian penetration of their lands in the 17th and 18th cents.; but the Buryats were gradually forced out of their tribal pasture lands by peasant colonists from Russia. Between the close of the 19th cent. and 1917 the Buryats had lost nearly 5000 sq. m. of land and the pop. declined rapidly. In E. B. M. there was a great influx of lamas from Mongolia, who possessed themselves of large areas of good land. At this time the people of B. M. were entirely illiterate, disease-ridden, and superstitious. But in 1921 2 Buryat autonomous regions were

formed, and in 1923 these were joined together, and, with the Baykal dist., formed into 1 autonomous rep., with its cap. at Verkhne-Udinsk (now called Ulan Ude). The pop. were, however, very backward, but were much helped in the arts of self-gov. by their Russian neighbours. By 1928 most of the people still remained nomad or semi-nomad. But an improvement began with the development of agriculture and the fisheries, literacy increased and the pop. grew. During the Five-Year Plans from 1928 onwards the economy of B. M. developed still more rapidly, and by 1937 most rural households were included within collective farms. Industry too expanded, and the nomadic Buryats began to enter the factories. In the second Five-Year Plan the Verkhne-Udinsk railway and locomotive works were estab., with a large electric power station. A new modern town was built above the Selenga R., with public utility services, hospitals, and schools. There are now in B. M. nearly 500 schools, with about 90,000 pupils and a score of technical colleges and higher educational institutions. Near Lake Baykal there are saw-mills, fish-canning factories, and tin-mines. Coal, gold, and manganese are also mined. Tungsten and molybdenum mines and refineries are in operation at Djidinsk (W. of Kyatkha). Lying between the Kuznetsk industrial region to the W., the new industrial centres of the Far E. and the gold-mining region of the middle Lena to the N., B. M. is an important food-producing region for the urb. pop. of these areas, as well as being a source for the supply of leather, glass, and other commodities manuf. from local raw materials. In 1938 a new railway was built between Ulan-Ude (the pop. of which is now 150,000) and Kiatkha, on the Mongolian frontier. Pop. 600,000.

Buryats, race of Mongolians inhabiting the neighbourhood of Lake Baykal. They resemble the Chinese in their small slanting eyes and their pigtails. Their religion is Buddhism, though there are Shamanists and Christians among them. Contact with the Russians took place first in the 16th cent., from which people they learned farming and irrigation, occupations in which they excel the Russians themselves. Their country has been formed by the Soviet Gov. into the Buryat-Mongol autonomous S.S.R. with an area of 135,700 sq. m. and a pop. of 600,000. Its cap. is Ulan-Ude. Pop. 150,000.

Burying Beetles, or *Necrophorus*, constitute a genus of the family of Silphidae. They are known also as carrion and sexton beetles, from their habit of burying small vertebrates by digging the ground from beneath the carcass until it sinks; the female then lays her eggs in the decaying matter. They make a curious chirping sound by rubbing the abdomen against their wing-cases.

Busaco, see BUCACO.

Busbars, short for omnibus-bars, main conductors in a power station (q.v.) from which the outgoing transmission or distribution lines are supplied. Sometimes

the B. are 'sectionalised,' each section feeding one or more lines in a group, the sections being linked through reactors which limit the current that might be fed into a faulty group from healthy ones. B. carry a heavy group current and are made of cylindrical or rectangular cross-section, usually hollow on account of skin-effect (q.v.), and supported on large insulators. **Busbecq**, Agier Ghislain de (1522-82), Flemish diplomat and traveller, b. Commines, and received a varied education at the univs. of Louvain, Paris, Venice, and Padua. Though he held various offices at the court of Emperor Ferdinand I, and was employed in a series of important negotiations, he is now chiefly remembered for his 2 visits to the court of Soliman II, Sultan of Turkey, at Constantinople. His invaluable letters dealing with these embassies, 1556-62, serve to illuminate the Turkish politics of the time. It seems likely that he intrigued further to embroil the sultan with the Shah of Persia in order to stop the former from pursuing his aggressive operations near Constantinople. 'Tis only the Persian stands between us and ruin,' he said; 'the Turk would fain be upon us, but he keeps him back.' In his journeys eastward he was accompanied by an artist who made drawings of rare animals and plants, and he came back to Europe with a fine botanical collection, besides many MSS. and coins. On his return to Vienna in 1562 he became tutor to the children of Emperor Maximilian II. His *Legationis turcicae epistolae IV*, and his accounts of his travels in Turkey, contain material that is of the utmost value to the historian of E. Europe.

Busby, Richard (1606-95), Eng. schoolmaster, educ. at Westminster and Oxford; from 1638 to 1695 he was headmaster of Westminster School; he is said to have educ. more distinguished men than any other teacher; among his pupils were Dryden, Locke, Robert South, Atterbury, Henry, and George Hooper. A severe disciplinarian, his name has become a byword for harshness, and the unfavourable impression of public schools given by Locke in his *Thoughts upon Education* may have arisen from experiences under B. He was, however, kind-hearted and charitable to the poor. At the Restoration he was made prebendary of Westminster. His works were mostly school eds. of the classics.

Busby, vil. in Lanarkshire, Scotland, on the White Cart Water, 5 m. from Glasgow, with a cotton mill and print works. Pop. 750.

Busby, ceremonial head-dress of the hussars and Royal Horse Artillery of the Brit. Army. It consists of a fur cap with an upright plume in front and a short bag of the same colours as the facings of the regiment hanging from the top down the right side. Not to be confused with the bearskin caps of the footguards and fusiliers. It is conjectured that the name may be of Hungarian origin, and the bag a survival of the Hungarian long padded bag which hung over the right shoulder to ward off sword-outs; but according to

a better opinion the origin of the word is unknown.

Busch, Julius Hermann Moritz (1821-1899), Ger. author and journalist, b. Dresden and educ. at Leipzig Univ. He became Bismarck's confidant and private secretary, and pub. sev. books about him. In 1878 he pub. *Graf Bismarck und seine Leute während des Krieges mit Frankreich*, which, as the title indicates, gave an account of Bismarck's doings during the war of 1870-1. This and other writings were incorporated in his *Life of Bismarck*, first pub. in 1898. In 1899 appeared his *Bismarck: some Secret Pages of his History*. His *Unser Reichskanzler*, 1885, dealt mainly with the administration of foreign affairs. His writings have considerable historical value, in spite of their uncritical attitude.

Busch, Wilhelm (1832-1908), Ger. comic artist and caricaturist, b. Wiesental, Hanover; he studied at academies at Düsseldorf, Antwerp, and Munich. In 1859 he joined the staff of *Fliegende Blätter*, the leading Ger. comic paper. With Oberländer he was the founder of modern Ger. caricature. In 1865 he pub. the first of a series of humorous illustrated poems—*Max und Moritz*—followed by *Der heilige Antonius von Padua*, 1870, *Die fromme Helene*, 1872, *Hans Hucklebein* 1872, and others. His humorous drawings and caricatures are very clever, and are notable for their simplicity. The types created by him are familiar in every Ger. household. He enjoys the same reputation for nonsense rhymes as Edward Lear in our own country.

Büsching, Anton Friedrich (1724-93), Ger. geographer and theologian. Prof. of philosophy at Göttingen, 1759; minister of Protestant congregation in St Petersburg, 1761; went to Berlin, 1766, as a director of a *Gymnasium*. One of the creators of modern geography, his *Description of the Earth*, 1754-92, was the most complete and scientific work of the kind, and was trans. into many languages. Wrote also *Magazine of History and Geography*, 1767-92, *Biographies of Celebrated Persons*, 1783-9, and *History of Lutheran Churches in Poland and Russia*, 1784-7. See his *Lebensgeschichte*, 1789.

Buschmann, Johann Karl Eduard (1805-80), Ger. linguist and librarian. He travelled throughout Mexico and studied the native languages. On his return he collaborated with the brothers Humboldt. Appointed by the Berlin Academy for the purpose, he completed Wilhelm von Humboldt's work *Die Kantsprache auf der Insel Java* (3 vols., 1836-9). He assisted Alexander von Humboldt in the editing of *Kosmos*, of which he pub. the 5th vol., 1862. Of his numerous pubs. on Malay-Polynesian languages and on native languages of America, the following are outstanding: *Aperçu de la langue des îles Marquises et de la langue tahitienne*, 1843; *Der athenasische Sprachstamm*, 1856; *Die Spuren der aztekischen Sprache im nördlichen Mexico*, 1859; *Das Apache* (3 vols.), 1860-1863; *Grammatik der sonorischen Sprachen*, 1864-9.

Busenbaum, Hermann (1600-68), Ger. Jesuit, b. Westphalia. Taught theology at Cologne; rector of Jesuit colleges in Hildesheim and Münster. He wrote *Medulla Theologiae Moralis*, a manual of cases of conscience, which went through 45 eds., 1645-70. It roused no real opposition till it appeared in Lyons and Cologne, 1716-33; condemned to be burnt by parliaments of Paris and Toulouse, 1757, for countenancing regicide. New eds. appeared later, notwithstanding.

Buses and Coaches. The close network of bus services through the length and breadth of Great Britain, from the southernmost point of England at the Lizard to the N. of Scotland, and indeed further on to remote places in the Shetland Isles, is unequalled anywhere else in the world. There are more public service vehicles in the 89,000 sq. m. ter. in England, Wales, and Scotland than in all the cities of the U.S.A. In 1956 there were in the U.K. 74,389 B. and C., 4042 electric trolleybuses, and 1917 tramcars—the last-mentioned a rapidly diminishing number—serving a pop. of 49 million people. By comparison France has only 30,000, W. Germany 25,000, Italy 17,000, and Spain 10,000 B. and C.

Under the Road Traffic Act, 1930, bus and coach services and excursions and tours open to the public are licensed by area traffic commissioners, who, except for London Transport in its monopoly area, determine routes, times, and fares. Vehicles are examined by Ministry of Transport examiners and certifying officers to ensure that they comply with the construction and use regulations and are maintained in good order.

There are altogether just over 5000 bus and coach operators, of whom 1333 in 1955 possessed 1 vehicle only. Operators of fleets of 10 or more totaled 741. But only 62 undertakings possessed more than 200 vehicles. The largest independent companies outside the major financial groups were Lances United Transport with 350 buses, plus 70 trolleybuses, operated by its S. Lances subsidiary, and the W. Riding Automobile Co. Ltd, with 442 vehicles. The largest company fleet is that of Birmingham and Midland Motor Omnibus Co. Ltd (B.M.M.O.) (1876 vehicles, of which 853 are double-deck.); the largest municipal bus fleet is Birmingham Corporation (1822, of which 35 are single-deck.), but Glasgow has 1916 road vehicles, if 988 trams and 95 trolleybuses are included.

Outside the metropolis there are 96 municipalities owning fleets of buses and trolleybuses; the Brit. Transport Commission (q.v.) owns 14,388 vehicles which are operated by some 40 bus companies of the wholly owned Tilling and Scottish Omnibus groups; in addition it has shareholding interests in 33 of the 41 operating companies of the Brit. Electric Traction group, which operates in all 12,074 B. and C. The Tilling group also operates 11 trolleybuses on the overhead equipment of Brighton Corporation, through its company, Brighton, Hove

and Dist. Omnibus Co. Ltd. to fulfil a mileage agreement; the Brit. Electric Traction (B.E.T.) group possesses 78 trolleybuses, 45 belonging to the Hastings Tramways Co. and 33 to the Moxborough and Swinton Traction Co. No tramways are now owned, but the Swansea and Mumbles Railway (the first passenger-carrying railway in the world) is operated by 13 100-seat electric trams. There are, besides the foregoing, 8 companies in which the Tilling and B.E.T. groups have joint interests, mainly concerned with coach operation or the working of bus and coach stations.

The area agreement was introduced from 1915 onwards to reduce competition between the large companies which were then free to develop their own territories to best advantage. With trunk routes secure from competition many services in rural areas can be operated at a loss. The proportion of unremunerative routes is over 50 per cent in some areas.

In London the development of the bus after its introduction by Shillibeer in 1829 was rapid; it was rationalised to some degree in 1856 when the London General Omnibus Co. (L.G.O.C.), French in its original conception) merged about 75 per cent of the existing fleet. It continued to work in harmony with others through the associations of proprietors which organised the services and defended them against newcomers. This system broke down after the introduction of motor buses, which began seriously in 1904 when Thomas Tilling Ltd. a concern dating from 1847, decided to motorise an existing horse service. In 1908 the L.G.O.C. merged with 2 prin. motor-owning rivals (London Road Car and Vanguard fleets); in 1909 it began to design its own standardised silent lightweight motor buses, and in 1911 it gave up horse operation.

In the following year it was acquired by the Underground railway group, which also controlled 3 suburban tramway companies, and by 1914 had absorbed or made agreements with practically all other operators on the London streets. Competition again broke out in 1922; to control the influx of new buses, and to protect the tramways, the London Traffic Act, 1924, introduced restrictions and the L.G.O.C. purchased large numbers of independent buses between 1926 and 1929.

By that time Parliament had become persuaded that complete unification was necessary, and an Act of 1933 set up the London Passenger Transport Board (L.P.T.B.) to acquire the Metropolitan Railway and those of the Underground group, the L.G.O.C. and 55 large bus undertakings, many smaller concerns in the country area and parts of the large prov. companies fringing the monopoly area allotted to the board; the total ter. is nearly 2000 sq. m. in extent and is about 66 m. from Horsham to Baldock, and 43 m. from Windsor to Gravesend. There are certain out-workings of B. and C. to traffic points such as Tunbridge Wells. The L.P.T.B. also took over 14

municipal and 3 company-owned tramways.

Under the Transport Act, 1947, the L.P.T.B. as a public board type of entity was nationalised, and the undertaking is now the property of the Brit. Transport Commission, by which the management is delegated to the London Transport Executive (q.v.). A fleet of 7680 buses, 303 coaches, and 1764 trolleybuses was operated by it in 1955, constituting the largest public service vehicle fleet (9747) in the world under one management. As the trolleybus fleet is to be abandoned as the vehicles wear out, the Aldenham overhaul works (officially opened in 1956) has a capacity for dealing with more than 10,000 vehicles at the rate of up to 56 a week for major accident damage, and complete overhauls at intervals of 3½ years. Buses and trolleybuses are operated from 113 garages. The coaches provide limited stop service under the fleet name 'Green Line' from central London to points on the fringe of the London Transport area, and on some peripheral services such as Windsor to Gravesend via Kingston, Croydon, and Bromley.

Although municipalities were given the power to acquire tramway systems after 21 years of operation under the Tramways Act, 1870, it was not envisaged that they should be operators, until in 1882 Huddersfield was forced to operate a system for which it had failed to secure an operating company. Sev. municipalities were operating horse buses along with horse or electric tramways by 1900; the first to enter upon motor bus operation was Eastbourne (which had never had trams) in 1903; Todmorden (another tramless tn) followed in 1907. In general municipal bus operation on an extensive scale developed after 1920. To-day fleets vary from the 7 buses of Bedwas and Machen Urban Dist. Councils to the 1822 of Birmingham or the 833 (with 988 trams and 95 trolleybuses) of Glasgow; among big fleets, Manchester had in 1955 1279 buses and 154 trolleybuses; Liverpool 1041 buses and 164 trams (trams due to be withdrawn 1957); Sheffield 677 buses and 295 trams; Edinburgh 464 buses and 126 trams (the latter were withdrawn during 1956); and Belfast 381 buses and 245 trolleybuses.

A number of municipalities have joint working or managerial arrangements, such as those between Burnley, Colne, and Nelson in Lancs; in Mon., the W. Mon. Omnibus Board is the property of the Bedwellty and Mynyddiawyn Urb. Dist. Councils. At Halifax, Huddersfield, Sheffield, and Todmorden the municipalities share in joint committees, originally estab. with the former railway companies, but now operated with the Brit. Transport Commission. At Brighton the local bus company and the municipality have a pooling arrangement of 72½ to 27½ per cent of mileage worked, and similar schemes apply at Plymouth, Exeter, Portsmouth, and elsewhere. Bristol owns the tn transport system, but it is entirely operated by vehicles of

Bristol Tramways and Carriage Co. Ltd., a member of the B.T.C. Tilling group. The W. Yorks Road Car Co. Ltd., also a member of the Tilling group, has a joint company with Kelghley Corporation, Kelghley-W. Yorks Services Ltd., which administers 54 buses operating about that town, and has a joint committee with York Corporation for operation of 65 vehicles on city services there. The municipal transport of Dover, Worcester, Kilmarnock, Perth, and other towns is similarly operated by a conveniently placed large company.

The origin of the Tilling group, as mentioned, dates back to 1847. Its growth began in 1914 with the establishment of a business at Folkestone; Ipswich followed soon afterwards. A considerable amount of expansion took place in association with the Brit. Automobile Traction Co. Ltd. (B.A.T.) (originally a Brit. Electric Traction (B.E.T.) subsidiary), the two coming together first in 1916 with the merging of mutual interests in that area as the E. Kent Road Car Co. Ltd. In 1928 the B.A.T. was renamed Tilling and Brit. Automobile Traction; the Tilling group further expanded by obtaining control of the National Omnibus and Transport Co. Ltd. in 1931. This company originated with the Clarkson steam bus and began operating a London fleet in 1909 and at Chelmsford (ex-Great E. Railway services) in 1913. In 1919 London operations were exchanged for a business owned by the L.G.O.C. at Bedford and a wide development in Essex, Beds, and from Cheltenham to Land's End followed. After the railways obtained road powers in 1928 the business was hived off as E. National (joint with L.N.E.R. and L.M.S.R.), W. National (G.W.R.), and S. National (S.R.) Omnibus Cos. At this period the Tilling Co. also invested in United Counties Omnibus (Northampton, founded 1913) and Bristol Tramways and Carriage Co. Ltd. (B.T.C.), which originated with horse trams in 1875, and is also a bus chassis manufacturer. In 1942 the Tilling and Brit. partnership was split between the Tilling and B.E.T. groups. The B.T.C. took over the omnibus interests of Thomas Tilling Ltd. in 1948, and added to it those of the Red and White group in S. Wales, Mon., and around Stroud, Newbury, and Basingstoke. The other B.T.C. group is Scottish Omnibuses Ltd., acquired in 1948 from the Scottish Motor Traction Co. (S.M.T.) Ltd. Founded in 1905 and operating between Edinburgh and the border, and from 1920 around Dundee, this company, jointly with the L.M.S.R. and L.N.E.R., took control of W. Alexander and Son (founded 1924), based on Falkirk and serving N.E. Scotland, and other companies remodelled as Western S.M.T. and Central S.M.T. Since the B.T.C. purchase, Highland Omnibuses, working N. of Inverness, has been absorbed and the Tilling operating company, Caledonian Omnibus Co. Ltd., based on Dumfries, transferred to

Western S.M.T., so that most of Scotland is covered by some 4600 vehicles owned by the B.T.C. David MacBrayne Ltd., the well-known shipping undertaking, operates from Glasgow to Campbeltown, up the W. coast to Fort William and Inverness, and on some of the inner isles, with 109 buses.

The Brit. Electric Traction Co. Ltd. was founded in 1896 to provide electric tramways, but with the object of improving motor-bus design had by 1905 formed the Brit. Automobile Development Co. Ltd., known from 1912 as the Brit. Automobile Traction Co. Ltd., when it became first an operating and then a shareholding undertaking. This company took over Birmingham and Midland Motor Omnibus Co. Ltd., vehicles which had in 1907 proved unsatisfactory in Birmingham; they were operated in E. Kent, and began a successful business at Deal. It invested in existing companies to form the nucleus of such concerns as Maidstone and Dist., Hants and Dorset, Ribbles and Cumberland, and started operations which expanded into the Thames Valley and N.W. Road Car and other concerns. Some of these undertakings went to Tilling after the 1942 div.

Some of the B.E.T. bus undertakings were developed by its tramway companies—N. General was in 1913 a bus subsidiary of the Gateshead Tramways Co. To-day the bus operating success of the latter is a subsidiary of N. General. S. Wales Transport and Potteries Motor Traction were built round the Swansea and Stoke tramway systems respectively, Yorks Traction and Yorks Woollen Dist. on the tramways at Barnsley and Dewsbury.

The B.M.M.O. (Midland Red) has become the successor to the B.E.T. tramways in the black country. As a result of an agreement with Birmingham Corporation in 1914 (2 years after motor-bus operation was resumed) the company gives a protective fare to the municipal activities in the city, and its own operations extend beyond Shrewsbury to the N.W., Leicester eastward, to Hereford in the S.W., and to Banbury south-eastward. This company has made the majority of its own chassis since 1922, and has introduced lightweight integral construction, underfloor engines, rubber suspension, independent front suspension, and use of plastic panels and pressings in bodywork. The last of the B.E.T. area agreement bus companies to be formed *de novo* was E. Yorks Motor Services Ltd. in 1926.

Throughout Ireland bus operation is almost a monopoly. In N. Ireland Belfast Corporation operates in the city area (with 381 buses and 245 trolley-buses), and all other bus operation is entrusted to the Ulster Transport Authority (U.T.A.), which also runs the railways and the road haulage undertaking for the 6 counties. These monopoly conditions have applied since the N. Ireland Road Transport Board was set up in 1935. The U.T.A. in 1955 owned 962 buses, of which 137 were

double-deckers. It operates the municipal routes in Londonderry. Its monopoly is so complete that coaches of Eng. companies on tour are not allowed to operate in their own livery, and this has tended to restrict the number of such tours provided.

In the Rep. the major bus undertakings were merged in 1945 as Coras Iompa Eireann (q.v.), or Irish Transport Undertaking, which also runs the major part of the railway system. There are 1333 B. and C. serving most parts of the 26 counties, of which 661 are double-deckers, used mainly on city services in Dublin, Cork, and Limerick; there is a large degree of standardisation. Apart from a score of small local undertakings, the major remaining concerns are the Great N. Railway Board, running in the area served by that railway from Dublin northward to the border (159 buses, of which 34 are double-deck, and 10 trams on the Hill of Howth line, abandonment of which has been agreed on), and the Londonderry and Lough Swilly Railway, a company which long ago gave up railway working in favour of buses (50 in stock, including 6 double-deckers).

The Amer. picture differs from that in Europe because of the very high proportion of motor-cars per thousand of the pop. There are large city fleets, but none approaches the size of the largest in Britain. New York City Transit Authority, for example, has about 2000 buses. The inter-urban network on the Eng. pattern is almost non-existent, although from Boston to Chicago and in other wide sweeps of country there were formerly vast mileages of linked-up inter-urb. tramways which developed continuously up to about 1920. The prin. cities are linked by high-speed coach services (called bus services in the U.S.A., where the Eng. trolleybus is called a 'trolley-coach'), of which the Greyhound group of companies is the best known, with a total of some 7000 vehicles. Scheduled speeds are often at up to 50 m.p.h.—only 2 hr 50 min. is allowed for 1 journey of 125 miles through a densely populated area, an average of 44 m.p.h. Another feature of the U.S. scene is the centralisation of schools and the extent to which special school buses are employed to take children from and to their homes. Vehicles in distinctive livery are used because it is thought that this makes operation safer; they number about 90,000. The total of ordinary buses of some 1400 urb. operators rose from 32,000 in 1939 to a peak of 58,000 in 1949, since when a decline has set in. Over the same period the trolley-coach total rose from 2184 to 6338.

Bush, Alan (1900–), Eng. composer, b. London, where he studied at the Royal Academy of Music, at which he became a prof. of composition in 1935. The words of many of his vocal works, chosen as expressions of his belief in communism, have militated against his success, and his operas *Wat Tyler* and *Man of Blackmoor* were produced in E. Germany because they show similar tendencies. But his work

is worth serious attention for its purely artistic qualities. It includes incidental and choral music, 2 symphonies, piano and violin concertos, chamber and piano music, songs, etc.

Bush, name, in Australia and S. Africa, for tracts of land covered with brushwood and shrubby vegetation.

Bush-buck, or **Bush-antelope** (*Tragelaphus scriptus*), the smallest species of B. from 2½ to 3 ft high and found over much of Africa S. of the Sahara. Numerous local races are distinguished, the most striking being the harnessed antelope, which is reddish with white stripes.

Bush-shrike is the name given to species of Formicariidae, a family of birds found in S. and Central America. The B. resembles the butcher-bird in its method of filling its larder by impaling victims on thorns.

Bushel, see METROLOGY.

Bushey (including **Bushey Heath**), urb. dist. near Watford, in Herts, England. The Royal Masonic Institution has 2 schools here with 700 boys in residence, and the Royal Caledonian School was enlarged by 2 wings in 1927. The Clergy Orphan Corporation have a school here with accommodation for 280 girls. Sir Hubert von Herkomer, the Victorian portrait-painter, who estab. an art school in B. in 1882, was buried here in 1914. B. Heath is an eccles. par. formed in 1889. Pop. 16,520.

Bushi, see SAMURAI.

Bushido (Samurai morality), traditional code of honour of the Jap. military class. It corresponds to European chivalry, and had a similarly feudal origin in the 12th cent. AD. Its governing principles are simplicity, probity, fortitude, justice, and allied virtues. During the 13th and 14th cents. B. was profoundly influenced by Zen Buddhism; and by the beginning of the 20th cent. it formed the basic character of the Jap. upper classes, notwithstanding the impact of W. civilisation.

Bushtings, electrical insulators, usually of ceramic material, protecting ingoing and outgoing cables on switch-gear, transformers, distribution boxes, etc. They are conspicuous on open-air substations as cylindrical or slightly tapering bodies with circular ribs. Small porcelain tubes lining holes in iron or wooden boards through which wires are drawn are also called B.

Bushire, also written **Bushehr**, **Abushehr**, is a prin. seaport of Persia (Iran), situated on the N. shore of the Persian Gulf. Owing to the shallowness of the water ships have to anchor at a considerable distance from the shore. B. occupies the N. end of a peninsula, and is encircled on all sides except the S. by the sea. The climate is very hot in the summer months. The city is deficient in water, and that required for drinking has to be brought from wells 2 or 3 m. distant. In 1763 an agreement was entered into with Shaikh Sadun of B. for the estab. of an Eng. factory at B., the agreement being confirmed by Karim Khan, the Persian ruler, but in 1769 the

English withdrew from B. to Basra. In 1778 B. became the Eng. H.Q. on the Persian Gulf.

Bushmen, nomadic people of S. Africa. The most primitive aboriginal race of S. Africa, they were once the only human inhab. of that vast dist., but, driven westward by more advanced later arrivals, they are now found mainly in the barren dists. extending from the inner ranges of the mts. of Cape Province, through the Kalahari desert, and thence to the dists. about the Orambo R., N. of Damaraland. Their language approaches that of the Hottentots, who are indeed thought to be a cross between B. and some Bantu-speaking peoples, and is monosyllabic.



E.N.A.

A BUSHMAN WOMAN

Its chief peculiarity is the use of 'clicks' as certain consonants. They are of very small stature, with a long and low skull, and large and prominent cheekbones. In complexion they are of a dirty yellow colour. Their only clothing consists of a piece of skin in a triangular form, which is passed between the legs and tied round the waist. The women wear long skin wraps. The dwelling-places of these people consist of low huts made of reed mats, or holes in the earth. Their household utensils are few and roughly made. The ostrich eggshell is used for carrying water. The people live chiefly by hunting, using for weapons the primitive bow and poisoned arrows. They eat practically anything, roots, game, insects, snakes, frogs, lizards, and honey being some of their delicacies; also ants' pupae, or 'bushman's rice,' which the women obtain by means of digging sticks. B. are intelligent, musical, fond of dancing, and great mimics. Tribal organisation is simple. Each band, consisting of a few families, living independently in a large ter. within which it alone has hunting rights; trespass is met by fighting. They

have no concrete idea of God, though their legends indicate a vague belief in an 'All-Father.' Northward the B. appear to improve both in stature and in general condition. There are said to be about 14,500 B. in S. Africa, but it is impossible to gauge their numbers with any certainty. The B. appear to have been the bringers of Palaeolithic culture to S. Africa from N. Africa or perhaps Europe. Their art, examples of which are found engraved in colours on rocks or cave walls in various parts of S. Africa, strikingly resembles the cave paintings perpetuated in E. Spain by Stone Age artists of the Aurignac culture. The art of the B. does not seem to have been practised within the last cent. See M. C. Burkitt, *South Africa's Past in Stone and Paint*, 1928, and I. Schapera, *The Khoisan Peoples of South Africa*, 1930. Bushmills, mkt tn of co. Antrim, N. Ireland, near the Giant's Causeway (q.v.). Pop. 970.

Bushnell, Horace (1802-76), eminent Amer. theologian, was b. at Bantam, Connecticut. He graduated at Yale in 1827, and in 1833 was ordained pastor of the N. Congregational Church at Hartford, where he soon became famous on account of his remarkable power as a preacher and for the depth of his theological writings. He took an active interest in the organisation of a college in California (afterwards univ. of California). Some of his chief works are *Christian Nurture*, 1847, *God in Christ*, 1849, *Nature and the Supernatural*, 1858, and *The Vicarious Sacrifice*, 1866. For *God in Christ* he was charged with heresy, and unsuccessful attempts were made to bring him to trial. See M. B. Cheney, *Life and Letters of Horace Bushnell*, 1880.

Bushrangers, in Australia, a class of armed robbers, originally consisting of runaway convicts. They were a great scourge in the outlying dists., especially in Tasmania, during the first part of the 19th cent. In 1815 martial law was proclaimed in this dist., and a determined effort was made to stamp them out. The desperadoes, however, banded together in large gangs, sometimes to the number of fifty, and fought pitched engagements with the police. The drastic Bushranging Act of 1830, renewed in 1834, at last succeeded in rooting them out. The most famous B. were the Kelly gang of 4 men. In 1879 they held up the vill. of Yerilderie, New S. Wales, but when repeating the exploit in the following year at Glenrowan, in N. Victoria, they were besieged in the hotel and 3 shot. All wore heavy armour. Ned Kelly, the sole survivor, was hanged at Melbourne.

Bushy Park, see HAMPTON COURT.

Busiris, Gk name of prin. shrine of Osiris in the E. Delta, the modern Abu Sir on Damietta branch of the Nile. Later in Gk legend a mythical King of Egypt and founder of Thebes, who was slain by Heracles.

Busk, Hans (1815-82), one of the chief originators of the volunteer movement. He was educ. at King's College, London, and Trinity College, Cambridge; called

to the Bar in 1841; made high sheriff of Radnorshire in 1847. He founded a rifle club at the univ. and lectured on the volunteer movement. He helped to revive the Victoria Rifles. He was also familiar with naval construction, and was the first to advocate the estab. of life-ship stations. He helped to found the School of Cookery at Kensington.

Buskin, half-boot or high shoe lacing tight to the leg; in particular the thick-soled *couthurnus* used by auct. tragic actors in order to increase their height, in which sense it is opposed to *soccus* (sock), the light shoe worn by actors of comedy.

Busoga, dist. in E. Uganda occupied by the Ba Soga, a Bantu people akin to the Baganda (q.v.). To-day much economic development is taking place in B., based on the dam built across the Nile at the Owen Falls, Jinja. See L. A. Fallers, *Bantu Bureaucracy*, 1956.

Busoni, Ferruccio (1866-1924), It. composer and pianist; his father was a clarinet player and his mother a Ger. pianist. He first appeared in public at the age of 7, at Vienna. He studied there, and when he was 17 a gold medal in his honour was struck at Florence, and the Accademia Filarmonica of Bologna elected him a member. At the age of 20 he removed to Leipzig to devote himself to composition; in 1889 he accepted a post as teacher at Helsingfors; and in 1890, after winning the Rubinstein prize, he was prof. at the Moscow Conservatoire for a year. In 1891-3 he taught in the New England Conservatory at Boston. He then took up residence in Berlin, but made extensive concert tours. As a pianist B. was considered to have the most powerful individuality and greatest technical mastery since Liszt and Rubinstein. As a composer the art of his earlier years is summed up in the monumental piano concerto, op. 34. His style is neo-classical in the best sense of both words. Specimens of his style at its best are to be found in his later sonatas, *Sarabande* and *Cortège* from the *Faust* music and the monumental *Fantasia contrappuntistica* for piano. In dramatic art, he selected for treatment supernatural subjects, myths, or fantasies. *Die Brautwahl* (first performed 1912) takes its plot from a fantastic tale by E. T. A. Hoffmann; *Turandot* is from Gozzi's drama, and this and his *Arlecchino*, 1918, belong to the old It. *commedia dell'arte* (q.v.). His third opera, *Doktor Faust*, was left unfinished and completed by Philipp Jarnach. B. also wrote much orchestral and chamber music. Some rate his compositions very high and think that the rest of the world underestimates them. See life by E. J. Dent, 1925.

Buss, Frances Mary (1827-84), pioneer of higher education for girls. Founded the N. London Collegiate School.

Bussaco, see BUCCACO.

Bussanga, see BORGU.

Bussora, see BASRA.

Bussy, Roger de Rabutin, Comte de (1618-93), Fr. writer, b. Epir; entered the army and fought in sev. campaigns, and became notorious for his affairs of

gallantry. In 1659 he was banished from the court; he then wrote for the amusement of his mistress the *Histoire amoureuse des Gaules*. This gave offence to the king and B. was sent to the Bastille, from which he was only liberated on condition that he retired to his estates. Here he wrote his *Mémoires et Correspondance*.

Bust (from Fr. *buste*; It. *busto*, origin unknown) is a head and shoulders representation of a person carved in the round. The Greeks used to carve ideal Homers and Sapphos, but the B. of Pericles is almost the earliest authenticated portrait. Life-like B.s of the Rom. emperors, most of them set on a pedestal, may be seen at the Brit. Museum. A B., of course, may be carried out in any material: marble, bronze, etc.

Bustamante, Alexander (c. 1890-), Jamaican labour leader and Caribbean statesman, of Irish and Jamaican parentage. He has been leader of the House of Representatives, and stands for moderately progressive politics.

Bustamite, variety of the mineral rhodinite ($MnO.SiO_2$). B., in addition to the silica and manganese, contains also from 9 to 15 per cent of lime. It is greyish-red in colour and crystallises in the triclinic system.



BUSTARD

Bustard is a word derived from the Lat. *avis*, bird, *tarda*, slow, and is applied to the family Otidiidae. *Ots tarda*, the great B., is now found only in S. Europe, Morocco, and as far E. as Persia, but was formerly the largest land-fowl of Britain. The male bird measures about 8 ft across the wings and 4 ft from its bill to its tail. In England it was found on Salisbury Plain and in E. Anglia, but was exterminated by about 1838. However, there is a record from Burwell Fen, Cambs, in Feb. 1856.

Busto Arsizio, It. tn, in Lombardy (q.v.), 14 m. S. of Varese (q.v.). It has two fine 16th-cent. churches. Cotton is manuf. Pop. (tn) 41,300; (com.) 52,900.

Butadiene, in chem. a di-olefinic hydrocarbon, which occurs in cracked petroleum and in the gases therefrom. Formula, $\text{CH}_2 = \text{CH} - \text{CH} = \text{CH}_2$. It can be obtained synthetically, but is made in the laboratory by the thermal decomposition of fusel oil. It has been used for making synthetic rubber.

Butane. There are 2 hydrocarbons having the formula C_4H_{10} . B., $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$, is an inflammable gas with boiling point 0.5°C ., and isobutane, $(\text{CH}_3)_2\text{CHCH}_3$, is a gas of similar properties with boiling point about -12.1°C . They are liquefied under compression and supplied in cylinders as domestic illuminants and heating fuels. Propane (C_3H_8) has a boiling point of -42.2°C ., and is supplied similarly, chiefly for industrial use. These are sometimes referred to as liquefied petroleum gases (L.P.G.).

Butcher, Samuel Henry (1850-1910), classical scholar, b. Dublin, a son of Samuel B., bishop of Neath. He was educ. at Marlborough and Cambridge, and in 1882 succeeded Blackie as prof. of Gk at Edinburgh, resigning in 1903. He was a Unionist M.P. for Cambridge Univ. from 1906 till his death. He collaborated with Andrew Lang in a trans. into Eng. prose of Homer's *Odyssey*, 1887. His works include *Some Aspects of the Greek Genius*, 1891, and *Aristotle's Theory of Poetry and Fine Art*, 1895.

Butcher-birds, see **SINKERS**.

Butcher's Broom, or *Ruscus aculeatus*, is a European species of Liliaceae which grows as a shrub in Britain. It is noted for its curious branches, which are phylloclades arising in the axil of a small scaly leaf. The phylloclade resembles a flattened leaf in the middle of which the flowers are borne in the axils of minute scaly leaves. The flowers are dioecious, and the fruit is a berry.

Bute, John Stuart, 3rd Earl of (1713-1792), courtier and statesman, son of the second earl, b. in Edinburgh, educ. at Eton, and succeeded to the title in 1723. His introduction into a prominent part in Eng. court life was practically accidental. He was called upon to perform some trivial service for the Prince of Wales in a moment of emergency, and immediately became a great friend of the prince and princess. After this date, 1747, he was constantly in attendance on the Prince of Wales, and had great influence with him. On the death of Frederick his influence over the young Prince George was very great, and it was he who instructed the prince on the lines of Bolingbroke's patriot king and gave him his extravagant ideas of the powers and duties of the kingship. Between the years 1756 and 1760 he took a very active part in political negotiations, but was practically a political nonentity when the death of George II raised him to a position of immense importance as the confidant of the new king in 1760. He immediately began to carry out the policy in which he had already instructed George III, of making the king of overwhelming importance, of lessening the authority of Parliament, and of breaking the Whig oligarchy. Pitt

resigned, B. was given a place as secretary of state, and in 1762 he became Prime Minister. He was violently unpopular, and was scurrilously attacked in the press and by cartoons. In 1763 peace was made with France and Spain at Paris. Bribery and corruption had by this time obtained for him a majority in the House of Commons, but he still aroused the bitterest hostility by his policy, and B. was eventually forced to resign. After 1765 he had no longer any power over the king, resigning his positions and having his influence taken from him. His administration, though one of the worst that have ever been known in Eng. politics, dependent for its support entirely upon the confidence of the king and the corruption of Parliament, was in fact less of a political innovation than has sometimes been supposed. See L. B. Namier, *The Structure of Politics at the Accession of George III*, 1929.

Bute, or **Buteshire**, co. of Scotland, comprising the is. of Bute, Arran, Great and Little Cumbrae, Holy Isle, Pladda, and Inchmarnock, lying in the Firth of Clyde. Bute is separated from Argyll by the Kyles of Bute, and Kilbrannan Sound separates Arran from the same co. The is. were taken from the Norwegians by Alexander III, King of Scotland. Agriculture is the prin. industry, oats being the chief crop. Cattle and sheep are reared, dairying being important, and there is some fishing. The 3 main is. are much favoured as holiday resorts. Area 220 sq. m.; pop. 18,000.

Bute Island, in Bute co., Scotland, in the Firth of Clyde, separated from Argyllshire by the Kyles of Bute, a narrow channel less than 1 m. wide. The is. is 5 m. distant from the Argyllshire coast, and 6 m. from Arran. It is 16 m. long and 3 to 5 broad. The coast is rocky, and in the interior are sev. small lochs, the prin. of which are Lochs Fad, Ascog, and Quilen. The soil is light and gravelly, but produces excellent crops. Soft red sandstone, slate, whinstone, and grey granite are found. The is. is celebrated for its salubrious climate, which makes it a favourite resort of invalids. Rothesay, a popular seaside resort, is the chief tn. Mt Stuart, 4 m. S. of Rothesay, is a seat of the Marquess of Bute. Pop. 13,500.

Butea is a genus of leguminous plants named after John, Earl of Bute; the 4 species are natives of India and China. *B. frondosa*, the dhak, pulas-tree, or bastard teak, is a native of mountainous dists. of Hindustan, and is noted for its great beauty. It yields lac and a bright red astringent juice known commercially as E. Indian kino, while the flowers yield a bright yellow dye. *B. superba* grows on the mts of Coromandel.

Butera, tn in Sicily (q.v.), 22 m. SSE. of Caltanissetta (q.v.). Pop. 9000.

Butler, Alban (1711-73), the hagiographer, was b. Northants, and at an early age was sent to college at Douai, where he became prof. successively of philosophy and divinity. He was sent subsequently on the Eng. mission, and was some time chaplain to the Duke of

Norfolk. At length he became president of the college of St Omer. His chief work is *Lives of the Fathers, Martyrs, and other Principal Saints*. It cost him the labour of 30 years, and first appeared in 5 vols. in 1756-9. On account of B.'s strong eccles. bias and defect of scholarship and critical sagacity, his works cannot be regarded as authoritative.

Butler, Benjamin Franklin (1818-93), lawyer and soldier, was at one time one of the most execrated men in the S. commonwealths of the U.S.A., owing to his conduct during the Civil war. He was b. Deerfield, New Hampshire. On the death of his father, he removed to Lowell, Massachusetts. He was admitted to the Bar in 1840, and became noted as a criminal lawyer. He served in the Lower House of the State Legislature in 1853 and in the State Senate in 1859, being at that time a Democrat. When the Civil war broke out, he became a volunteer officer in the Union forces, and in 1862 led an expedition against the great S. seaport of New Orleans, which he captured on 1 May. As commander in charge of this big city, his rule was marked by the utmost severity. For neglecting orders given him by Gen. Grant in the attack on Fort Fisher, near Wilmington, he was removed, and that ended his military career. He returned to Massachusetts, and was sent as Republican Congressman to Washington from 1867 to 1879, except in 1875-7. He was elected governor of the state in 1882.

Butler, Charles (d. 1647), miscellaneous writer, b. Bucks. Educ. at Magdalen College, Oxford, he spent most of his life at Basingstoke, first as a schoolmaster and afterwards, for nearly 50 years, as vicar of Wootton St Lawrence, 3 m. from the town. He wrote a work on bees, 1609, a treatise on affinity as a bar to marriage, 1625, a Lat. treatise on rhetoric, 1629, a work on Eng. orthography, 1633, and *The Principles of Musick in Singing and Setting*, 1636.

Butler, Charles (1750-1832), lawyer and writer. He was educ. at Douai, and in 1775 entered Lincoln's Inn. In 1791 he was the first to be called to the Bar under the terms of the Catholic Relief Act. Amongst the books, about 50 in number, which he pub. may be mentioned *Coke upon Littleton's Laws of England*, 1775, *Reminiscences*, 1821-7, and *Book of the Roman Catholic Church*, 1825.

Butler, Lady Eleanor (c. 1745-1829), Irish recluse. She lived in seclusion with Miss Sarah Ponsonby (1755-1831), at Plasnewydd in the vale of Llangollen for over 50 years. They were known as 'The Maids of Llangollen,' or 'The Ladies of the Vale,' and were visited by many distinguished people. Lady Eleanor belonged to the Irish house of Ormonde, and her brother succeeded to the earldom in 1791.

Butler, Elizabeth Southerden, Lady (1844-1933), painter, daughter of T. J. Thompson, was b. Lausanne, Switzerland. In 1877 she married Lt.-Gen. Sir Wm Francis B. She studied in Florence, exhibited 'Missing' at the Royal Academy

in 1873, and this was followed by a succession of successful pictures, dealing chiefly with military subjects. Among them were 'The Roll Call,' 1874, '28th Regiment at Quatre Bras,' 1875, 'Balaclava,' 1876, 'Inkerman,' 1877, 'Scotland for Ever,' 1881, 'Floreat Etona,' 1882, 'Tel-el-Kebir,' 1885, 'Evicted,' 1890, 'A Cistercian Shepherd,' 1908. She pub. *Letters from the Holy Land*, 1903, *From Sketchbook and Diary*, 1909, and *An Autobiography*, 1923.

Butler, Frances Anne, see KEMBLE.

Butler, George (1774-1853), headmaster of Harrow and dean of Peterborough, b. Pimlico, London. He was educ. at Cheyne Walk School, Chelsea, and Sidney Sussex College, Cambridge. Elected a fellow of the college, he acted for some time as mathematical tutor. In 1805 he became headmaster of Harrow School, retaining this position until 1829. He then retired to his living at Gayton, Northants, and was appointed dean of Peterborough in 1842. He was a great mathematician, a distinguished classical scholar, and spoke sev. languages fluently. Chief works are *Extracts from the Communion Service of the Church*, 1839, and *Statutes of Peterborough Cathedral*, 1849.

Butler, Henry Montagu (1833-1918), clergyman and schoolmaster, b. Gayton, Northants. He studied at Trinity College, Cambridge, and was headmaster of Harrow School, 1859-85. In 1885 he was made dean of Gloucester, and in 1897 appointed honorary canon of Ely. In 1886 he became master of Trinity College, Cambridge, being vice-chancellor in 1889 and 1890. Among his pub. works are various sermons reprinted from 1866 onward, including *Belief in Christ*, and other *Sermons preached in the Chapel of Trinity College, Cambridge*, 1898, and *Public School Sermons*, 1899; also the Romanes lecture for 1912, *Lord Chatham as an Orator*, and *Some Leisure Hours of a Long Life*, 1914.

Butler, James, see ORMONDE, DUKES OF.

Butler, Joseph (1692-1752), prelate, b. Wantage, being the son of a linen draper of that town. His father was a Presbyterian and Joseph was educ. (with the object of entering the Presbyterian ministry) at Gloucester and Tewkesbury. Whilst at the latter academy B. joined the Church of England. He entered Oriel College, Oxford, 1715. He took his degree in 1718, and was immediately appointed preacher at the Rolls Chapel, and was given the living of Stanhope by Talbot, Bishop of Durham. He resigned the prebendaryship of the Rolls Chapel in 1726, but while there he preached his famous 15 sermons. For some years, from 1726, he lived in practical retirement at Stanhope. In 1733 he was made chaplain to the lord chancellor, and in 1736 prebendary of Rochester, whilst in the same year he was attached to the service of the queen. In 1737 Queen Caroline d., and B. was appointed Bishop of Bristol; in 1740 he was made dean of St Paul's (one of the richest deaneries in England), in 1746 clerk of the closet to the king.

There is some evidence for the statement that in 1747 he was offered the primacy, which he declined. In 1750 he accepted the bishopric of Durham. He was buried at Bristol, where so much of his life had been spent. In 1736 had appeared his great work, *The Analogy of Religion*. See works, ed. J. H. Bernard, 1900.

Butler, Josephine Elizabeth (1828-1906), moral and social reformer, daughter of John Grey of Dilston, Northumberland; married in 1852 George B. (q.v.). From an early age she was interested in higher education and political and economic freedom for women, and led a nationwide campaign against Contagious Diseases Acts (see PROSTITUTION) which degraded women, repealed 1886. Continental campaigns revealed State brothels which were regulated hotbeds of disease and the main market for white slave traffic (confirmed by League of Nations Report, 1927). The revelations stirred Wm Coote, W. T. Stead, and others to work against this traffic. She believed in a free, confidential, and voluntary system for the treatment of venereal disease, confirmed by the estab. of such a system in Britain (after the Report of a Royal Commission, 1916). Her spiritual power, courage, and oratory brought thousands of supporters; amongst them John Stuart Mill, Victor Hugo, Cardinal Manning, and Harriet Martineau. She founded the Association for Moral and Social Hygiene (q.v.) and the International Abolitionist Federation. See life by M. G. Fawcett and E. M. Turner, 1928, and A. S. G. Butler, *Portrait of Josephine Butler*, 1954.

Butler, Nicholas Murray (1862-1947), Amer. authority on education, was b. Elizabeth, New Jersey, son of Henry L. B. He was at Columbia College, 1878-1882; was fellow in philosophy there 1882-4, visiting Berlin, Paris, and Oxford, and returning to Columbia College as instructor in philosophy. He became prof. and first dean of the faculty of philosophy, ethics, and psychology in 1890, when the college was made a univ., of which he became president in 1901. He was the founder and first president of the college for the training of teachers at New York. He founded the *Educational Review* in 1889, and ed. it until 1920. He pub. various works on education, upon which subject he held the cultural as opposed to the vocational view. By his conduct of the affairs of Columbia Univ. for 40 years he raised that institution and himself to a high position of independence and authority. He became a member of the Institut de France in 1923, and was chancellor of the Amer. Academy of Arts and Letters, 1924-8. He was awarded the Nobel peace prize in 1931. He received the honorary doctorate of at least 26 univs., including Oxford, Cambridge, and Manchester. His pubs. include *The Meaning of Education*, 1898, 1910, *True and False Democracy*, 1907, *Philosophy*, 1911, *The International Mind*, 1913, *Building the American Nation*, 1923, *The Family of Nations*, 1938, and an autobiography, *Across the Busy Years*, 1939.

Butler, Richard Austen (1902-), politician, b. Attock Seral, India, and educ. at Marlborough and Pembroke College, Cambridge. He had a brilliant academic career and in 1929 became Conservative M.P. for Saffron Walden. He was under-secretary at the India Office, 1932-7; parl. secretary to the ministry of labour, 1937-8; under-secretary at the Foreign Office, 1938-41, and Minister of Education, 1941-5, in which capacity he carried through the Education Act of 1944 which became known by his name. In 1945 he was Minister of Labour.

When the Conservatives returned to power in 1951 B. became chancellor of the exchequer. He held this post until Dec. 1955; during his term of office as chancellor of the country's economic situation improved considerably and taxation, especially direct taxation, was much reduced until the last 12 months, when the inflationary tendencies and unsteady dollar position caused financial restrictions and an increase in indirect taxes such as purchase tax. In Dec. 1955 B. became lord privy seal and leader of the House of Commons. After Eden's resignation, Jan. 1957, many expected that he would become prime minister. Eden was succeeded by Harold Macmillan, however, and B. retained his existing offices and also accepted that of home secretary. See life by F. Boyd, 1956.

Butler, Samuel (1612-80), satirist, was a Worces farmer's son. After being for some years page in the household of Elizabeth, Countess of Kent, he became clerk to sev. Puritan justices of the peace, some of whom are believed to have suggested characters in *Hudibras*. Sir Samuel Luke, one of these justices, is supposed to be the original of Hudibras himself. In 1662 B. was steward of Ludlow Castle. Aubrey describes him as 'strong-set, high-coloured, a head of sorrel hair, a severe and sound judgment; a good fellow.' His *Hudibras* (pub. in 3 parts, 1663, 1664, and 1668) is a satire on the Puritans, and while it ridicules the extravagances into which many of the party ran, it entirely fails to do justice to their virtues and their services to liberty, civil and religious. Charles II is said to have enjoyed the pungency of its wit and the resistless power of its ralleries, but, notwithstanding the contemporary popularity of the work, B. was neglected by the court and d. in poverty. Like Pope, B. is now more quoted than read. No doubt the story is but a bare framework, yet his mastery over rhyme and epigram, and his genius for making his characters depict themselves in the most contemptible light, form a splendid embroidery. B.'s poetical works were ed. by R. B. Johnson, 1893; collected works by A. R. Waller and R. Lamar, 1935-28. See lives by J. Aubrey, in his *Brief Lives*, ed. 1898, and J. Veldkamp 1923.

Butler, Samuel (1774-1839), cleric and classical scholar, b. Kenilworth; was educ. at Rugby and St John's College, Cambridge. Headmaster of Shrewsbury from 1798 until 1836, B. was appointed Bishop

of Lichfield in the latter year and held office until his death. His ed. of Aeschylus was pub. in 4 vols. 1809-16. See W. E. Heitland, *Dr Butler of Shrewsbury School*, 1897.

Butler, Samuel (1835-1902), author, b. Langer Rectory, near Bingham, Notts, son of the Rev. Thomas B., and grandson of Dr Samuel B., headmaster of Shrewsbury and later Bishop of Lichfield. B. was educ. at Shrewsbury and St John's College, Cambridge; he prepared for ordination but doubts led him to give up the idea, and in 1859 he went to New Zealand and became a sheep-farmer. *A First Year in Canterbury Settlement*, 1863, composed of letters home, was his first pub. but he himself regarded *Erewhon*, 1872, as his début in authorship. A few passages in *Erewhon* are taken from *A First Year*, a few of its ideas from articles and letters by B. in the New Zealand press, and the Erewhonian scenery is drawn from that of New Zealand. *Erewhon* ('Nowhere' backwards) is a Utopian satire, depicting a people with customs and practices often the opposite of ours: thus machines have been abandoned out of fear that they may become masters of men, and crime is treated as illness, illness as crime. *Erewhon* shows a remarkable insight into the development of some phases of 20th-cent. society, and its qualities of invention, wit, and grace, as well as its original ideas, have estab. its place among great satirical romances, together with its sequel *Erewhon Revisited*, 1901. The latter work is a more polished story than *Erewhon*, and its dominating theme, the origins of a religious myth, gives it more cohesion; but it has not quite the spontaneity of the first work. Between these 2 books B. pub. at his own expense (for he was a commercially unsuccessful author) sev. works on a variety of subjects, but his posthumously pub. novel *The Way of All Flesh*, 1903, overshadows all these. This autobiographical novel embodies some of his favourite notions, notably those on the causes and effects of the clash between generations; the painful relations between Ernest of the novel and his father, the Rev. Theobald Pontifex, are modelled on those of B. and his father, and sev. characters had their prototypes in real people in B.'s life. He began writing the novel in 1873, more or less at the instigation of Miss E. M. A. Savage, who read it in MS. as it progressed until 1885, when she d. and B. ceased work on it. Two sonnets on Miss Savage, whose opinion he took on his writings throughout their friendship, were printed in H. F. Jones's *Memoir*. It was following the pub. of *The Way of All Flesh* that B.'s work found an appreciative public, Bernard Shaw's note in the preface to *Major Barbara* having no doubt something to do with this: 'When I produce plays in which Butler's extraordinarily fresh, free, and future-piercing suggestions have an obvious share, I am met with nothing but vague cacklings about Ibsen and Nietzsche. . . . Really the English do not deserve to have great men.' Shaw has acknowledged his

indebtedness to B.'s theory of creative evolution as opposed to fortuitous natural selection, a theory expounded by B. in 4 straightforward books which followed *Erewhon*: *Life and Habit*, 1878, *Evolution, Old and New*, 1879, *Unconscious Memory*, 1880, and *Luck or Cunning?*, 1887, all concerned in controversy with Darwinism and the middle two involving a personal quarrel with Charles Darwin. These books have never been widely read, yet they have much of B.'s courage and humour, as indeed have his other writings, which include *The Fair Haven*, 1873 ('a work in defence of the miraculous element in our Lord's ministry upon earth, both as against rationalistic impugners and certain orthodox defenders'—an ironical 'defence' issued as by the late John Pickard Owen, with a delightful imaginary memoir of the author), *Alps and Sanctuaries of Piedmont and the Canton Ticino*, 1881, *Ex Voto, an Account of the Sacro Monte at Varallo-Sesia*, 1888, *The Life and Letters of Dr Samuel Butler* (his grandfather), 1896, *The Authoress of the Odyssey*, 1897, *Shakespeare's Sonnets reconsidered and in part rearranged*, 1899, and *The Iliad and The Odyssey rendered into English Prose*, 1898 and 1900 respectively. To the wide range of B.'s interests, painting and music should be added. When he first returned from New Zealand he took up painting seriously, studying at Heatherley's art school and exhibiting at the Royal Academy, where his painting, 'Mr Heatherley's Holiday' (now in the National Gallery), was shown in 1874. He was an unsuccessful candidate for the Slade professorship of fine art in 1886. Ten years after B.'s death was pub. *The Note-books of Samuel Butler*, 1912, now, after *Erewhon* and *The Way of All Flesh*, his best-known book. Ed. by his friend, Henry Festing Jones, the pub. *Note-books* give a classified selection of B.'s carefully kept personal memoranda in which he recorded everything he wanted to remember of experiences, conversations, ideas and opinions, quips and jests. The *Note-books* also include his hitherto privately printed *Seven Sonnets and a Psalm of Montreal*. B. never married. From 1864 until the end of his life he lived in rooms at 15 Clifford's Inn, London, attended by his servant-secretary Alfred Cathie, and spending a part of almost every day in the Brit. Museum reading-room. He d. on 18 June 1902. Collected ed. of B.'s works, ed. by H. F. Jones and A. T. Bartholomew (26 vols.), 1923-1926. See G. Cannan, *Samuel Butler, a Critical Study*, 1915; H. F. Jones, *Samuel Butler, a Memoir*, 1920; C. E. M. Joad, *Samuel Butler*, 1924; A. J. Hoppe, *A Bibliography of Samuel Butler*, 1925; Mrs R. S. Garnett, *Samuel Butler and his Family Relations*, 1926; G. D. H. Cole, *Samuel Butler*, 1947; P. N. Furbank, *Samuel Butler*, 1948; P. Henderson, *Samuel Butler, the Incarnate Bachelor*, 1953.

Butler, Sir Spencer Harcourt (1869-1938). Brit. administrator, educ. at Harrow and Oxford Univ. He entered the Indian civil service in 1888. As

deputy-commissioner of Lucknow he inaugurated many re-planning improvements and much reconstruction in the anct cap. of Oudh. In 1915 he became lieutenant-governor of Burma and, later, lieutenant-governor of the United Provs. In 1923 he returned, as governor, to Burma.

Butler, or Buttler, Walter, Count (c. 1600-34), Irish adventurer, was descended from the third Earl of Ormonde. He was present at the battle of Prague (1620), and accompanied James B., a kinsman, on his march to Frankfurt-on-Oder (1631), at the siege of which he greatly distinguished himself. He then served under Wallenstein (q.v.) and he was an accomplice in the murder of Wallenstein at Eger in 1634. For his share in this affair he was ennobled by the emperor.

Butler, William Archer (c. 1814-48), prof. of moral philosophy in the univ. of Dublin, was b. Annerville near Clonmel. He was brought up as a Rom. Catholic, but became a Protestant. Educ. at Clonmel School and Trinity College, Dublin, he joined the College Historical Society, and was appointed first prof. of moral philosophy at Dublin Univ. During the horrors of famine and pestilence in 1846-7 he laid aside all higher pursuits and toiled nobly among the poor as relieving officer. His chief works are *Sermons Doctrinal and Practical*, 1855-1856, *Lectures on the History of Ancient Philosophy*, 1856, and *Letters on Romanism*, 1858.

Butler, Sir William Francis (1838-1910). Brit. general, b. Suirville, Tipperary. Educ. at Dublin, he entered military service in 1858. Served in the Ashanti expedition in 1873, in Natal, 1879, and in the Sudan campaign of 1884-5. He was brigadier-general in Egypt until 1892, when he was promoted to the rank of major-general and stationed at Aldershot. He succeeded Gen. Goodenough as Commander-in-Chief in S. Africa in 1898. He acted as high commissioner during Sir A. Milner's absence in England. Before the outbreak of the Boer War B. was recalled because he expressed views on the military and political situation which were not in accordance with those of the home gov. He married, in 1877, Miss Elizabeth Thompson (see BUTLER, ELIZABETH). He pub. *The Great Lone Land*, 1872, and other works, and was the biographer (1890) of Sir George Colley. His autobiography was pub. in 1911.

Butler, city of Pennsylvania, N. of Pittsburgh, U.S.A., with coal- and oil-fields. Pop. 23,482.

Butlerage was an anct right of the Crown to buy up provisions and other necessities for the royal household at a valuation, even without consent of the owner. From this probably originates the custom of taking ducs in return for protection of ports and harbours. B. ceased to be levied in 1809.

Buto, in NW. Delta, home of Wadjet or Uto, the cobra goddess, guardian of the prehistoric kingdom of Lower Egypt. Wadjet retained this role after the union of Egypt along with the vulture goddess

of Upper Egypt. The uraeus emblem which distinguished royalty personified her.

Butobarbitone, see BARBITURATES.

Butomaceae, family of monocotyledonous plants found in marshes of tropical and temperate lands. The flowers, in umbels, are regular, hermaphrodite, with 2 whorls of 3 in the perianth, 9 to numerous stamens, 6 to numerous carpels, with numerous ovules, and the fruit a group of follicles. Chief genus is *Butomus*.

Butomus, *Butomus umbellatus*, flowering rush, is the single species of its genus in the family Butomaceae. It grows in Europe and Asia, and is accounted the handsomest herbaceous plant of the Brit. flora. The flowers are rose-coloured and the leaves are sword-shaped.

Buton (Dutch Boston) Island, ls. of the Malay Archipelago, separated from the SE. ray of the Celebes and the ls. of Muna by a narrow strait. It is high and wooded, and produces timber, rice, sago, etc. The pop. are Malays, mostly Bugis (q.v.); the area is 1700 sq. m. Pop. 18,000.

Bütow, see BYTOW.

Butrinto, small fort. tn, opposite Corfu, on the coast of Albania. Lake Vivari lies to its N. It has a little harbour, and is the seat of a Gk bishop. The Venetians held the tn till 1797, when it was occupied by the French, who in their turn gave it up to the Turks in 1799. The ruins of Butrintum, a Rom. colony mentioned by Strabo, lie near at hand. They include a mile of old Rom. wall. Pop. about 2000.

Butt, Dame Clara (1873-1936), contralto singer, b. Southwick, Sussex. She was trained in the Royal College of Music, and made her début in Dec. 1892. One of the most conspicuous of her many successes was in Elgar's *Sea Pictures*, 1899, specially written for her. In 1900 she married Kennerley Rumford, baritone vocalist, with whom she appeared on many concert platforms throughout the country. In 1917 she was made D.B.E.

Butt, Isaac (1813-79), leader of the Home Rule party in Ireland, was b. Donegal; educ. at Trinity College, and took his degree with high distinction in 1835. In 1836 he was appointed prof. of political economy and was called to the Bar in 1838. He was a Conservative in politics, and in 1852-65 was M.P. for Youghal. He changed his political opinions, and on his election for Limerick in 1871 he became leader of the Home Rule (q.v.) party. A Home Rule League was formed, but lasted only a short time. He lost hold on his associates, and was called a Tory in disguise and a traitor. His constitutional policy was abandoned by his successor, Parnell.

Butt, see METROLOGY.

Butt-joint, joint (often in ironwork) in which the edges or ends of the pieces united come squarely together without overlapping.

Butte, city and co. seat of Silverbow co., Montana, U.S.A., on the W. slope of a range of the Rocky Mts. Near it is the famous Anaconda copper-mine, and B.

produces about one-third of the entire copper output of the U.S.A., besides producing large quantities of gold and silver, zinc and manganese. It manufs. conduits, bricks, mining equipment, chemicals, and optical and electrical apparatus. Montana State School of Mines is here. Pop. 33,251.

Butter, article of food consisting of the fatty substances present in milk, together with some of the other constituents and a small proportion of salt. The general process by which B. is made involves separating the cream or fatty matter from the milk and churning the cream until the fat globules are burst and the fat particles adhere together in a fairly solid mass. The variations in particular methods consist in the employment of more or less elaborate machinery in the different details of the process, and the extent to which bacterial action is artificially aided. Cow's milk contains, on the average, about 3.7 per cent of fat, but the amount varies with the breed and individual, with the season of the year, and even with the day of the week—Monday's milk being usually deficient in fat as compared with the rest of the week, while the fat in Tuesday's milk is usually above the average. The fat is present in the form of globules varying in diameter from .0001 mm. to .01 mm. At temps. above 32° C. the fat is in a liquid condition, and slowly solidifies as the temp. is lowered. The gradual nature of the solidification is shown by the slow increase in the sp. gr. of the milk due to that solidification. As milk is cooled, therefore, the fat tends to rise to the surface, because the density of the serum or liquid portion of the milk increases practically in proportion to the decrease in temp., while the fat, being for the most part still in the liquid condition, has not increased in density in the same proportion. The most widespread manner of separating cream from milk is therefore to allow the liquid to stand in shallow pans in a cool room for about a day, when the particles of fat slowly ascend to the surface as the effect of the differing densities. This method is not only slow, but is also not economical, because a fair proportion of fat still remains in the skim milk. Various types of mechanical cream-separators are now widely used. The general principle underlying the action of all these machines is the same. The milk is swirled round a central feeding tube, so that the heavier constituents are projected by centrifugal force to the outer portion of the chamber, while the lighter fat may be collected at a point near the centre of the rotating piece. Milk placed in a separator at or above boiling-heat is resolved into cream and skim milk in a few minutes. The next operation is known as 'ripening,' and consists essentially in allowing the multiplication of lactic bacilli in the cream. The object of this process is to produce a more palatable article, and to shorten the operation of churning, as it is found that B. more readily forms in the churn when ripened cream is used. The popular and primitive method of ripening is to allow

the cream to stand in a cool room, with occasional stirring, until the practised taste of the dairymen indicates that the process has sufficiently advanced. The work is expedited, however, by using a 'starter.' This consists of a pure culture of the lactic acid bacillus, and is stirred into milk which has been sterilised and brought to a temp. of 80° F. This temp. is maintained until the milk has become sour, when a portion is added to cream that needs ripening. In either method care must be taken to prevent other bacteria from having access to the cream. To this end all vessels and utensils are scalded before use, moistened muslin curtains are used to entrap dust, and the utmost cleanliness is enforced in all branches of the dairy work. When the cream has sufficiently ripened, it is placed in a churn and agitated until the B. forms. Many varieties of churns exist, both of the kind in which a number of blades are dashed or revolved in the contained cream, and of the kind where the vessel itself is turned end over end, the churning consisting in the liquid dashing against the sides of the vessel. The forming of the B. can easily be recognised by the different sound of the 'splash,' or by the different effort required if the churn is actuated by hand. After churning the buttermilk has to be washed from the butter with cool water, and the solid product then presents an attractive granular appearance. To rid it of the excess of water, and incorporate the desired amount of salt, it is necessary that the B. should be 'worked.' This may either be done by hand, which should be quite cool and clean, or by one of the mechanical workers upon the market. The operation in any case consists in pressing the B. in as many different directions as possible, at the same time continually changing the relative positions of the different parts of the bulk. B., when ready for sale, contains on the average 15 per cent of moisture, about 1 per cent of salt, and over 80 per cent of fat. Other solids (protein and sugar) total 1½ per cent. The fat consists of a mixture of glycerides, the glycerol base being united with oleic, palmitic, myristic, lauric, butyric, caproic, capric, steric, and caprylic acids in proportions roughly indicated by the order of the names. B. may be adulterated by the addition of other animal fats, and by the introduction of preservatives, as borax, formalin, etc. There are many methods of detecting B. adulteration, one of the most reliable being the determination of the refractive index of a layer of B. by a Zeiss refractometer. World production of B. was estimated in 1954 to be about 54,200,000 cwt.; imports into Great Britain and N. Ireland for the same year were 5,646,000 cwt. Home production was 456,000 cwt. compared with 893,000 in 1938. Production in exporting countries has not fallen to any great extent and in some has increased. In 1954 exports were: New Zealand, 2,658,000 cwt.; Australia, 955,000 cwt.; Rep. of Ireland, 87,000 cwt.; Denmark, 2,777,000 cwt.; Netherlands,

1,024,000 cwt. Imports from Commonwealth countries were duty free; those from other countries were subjected to a tariff of 15s. per cwt. The problem of controlling imports to protect home producers which existed in the 1930's ended with the Second World War and the consequent reduction in supplies and rationing. The rationing of fats ended in May 1954, and at the same time price control and subsidies were also abandoned. It is early yet to judge the effect of this legislation on home production of B. and the import trade. See also CHEESE; CREAMERY; DAIRIES; DAIRY FARMING; FAT; MARGARINE.

Butter-bur, or *Petasites hybridus*, is a species of Compositae often found in damp fields. The plant is dioecious, and only the male florets yield nectar. There are about 30 florets in the male inflorescence, and 5 times as many in the female. The leaves are large, about the size and shape of rhubarb.

Butter-tree, or *Pentadesma butyracea*, is the single species of its genus in the family Guttiferaceae, found in W. Africa. It yields a fatty substance, which is used as tallow and as a substitute for butter. *Madhuca butyracea*, a species of Sapotaceae, is the Indian B., from the seeds of which a fatty juice is obtained and used in soap-making.

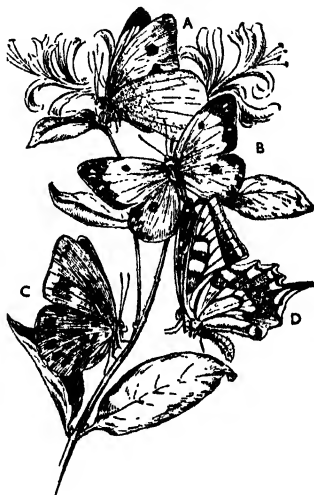
Buttercup, see RANUNCULUS.

Butterfield, William (1814-1900), architect, b. London. Became a leader of the 'Gothic Revival.' He held quite original views as to colour in architecture, his view being that any combination of natural colours of the materials was permissible. His first important building was St Augustine's, Canterbury. His reputation was made by All Saints', Margaret Street, London, and he also built St Alban's, Holborn, Keble College, Oxford, the chapel of Balliol College, and extensions to Merton College, Oxford. He carried out many restorations of old buildings.

Butterfish, name given to various kinds of fish on account of their slippery nature: *Coriodon pullax*, a species of Labridae or wrasse, known in New Zealand as kelp-fish or B.; *Centronotus gunnelus*, a species of blenny-fish, known in Britain as the gunnel or rock-fish; and *Poronotus triacanthus*, or dollar-fish, found in the W. coast of the U.S.A.

Butterfly is the name given to the Lepidoptera which were included in the series Rhopalocera, the order being completed by the other series, Heterocera, or moths. There is no definite div. between moths and B.s, but they are generally distinguished from one another by their wings and antennae. All the B.s have clubbed antennae and no frenulum, a coupling apparatus which projects from the hind wing and unites it with the fore wing, while the moths have antennae of various shapes, and when clubbed a frenulum is present; the former also are day-flying insects, while the latter are usually nocturnal in habit. Nearly all B.s remain with their wings in an upright position when at rest, so that only the under surface is seen, but moths keep their wings

expanded during repose. The species of B.s are nearly altogether vegetarian, living on nectar, but a few feed on animal matter, such as decayed fish, and the larvae of others prey on vegetarian insects. In coloration B.s may be dingy white or yellow, or may be any brilliant colour, such as red, orange, blue, purple; and it is noteworthy that the males are usually brighter than the females. Mimicry in colouring is frequently observed in different species, which resemble leaves in their greenness or bark in their brownness, and thus save themselves from being victimised by birds.



BRITISH BUTTERFLIES

A, cabbage white; B, pale clouded yellow
C, red admiral; D, swallow-tail.

The colours are caused partly by pigments, but partly also by interference phenomena on the scales, like those to be seen on a soap bubble. The distribution of B.s is world wide, but though they are found in almost the very coldest regions, they occur in greatest abundance in warm climates. In Britain there are about 70 native species, and the total number described throughout the world amounts to sev. thousands. In structure B.s greatly resemble many other insects, but they are noted for the slenderness of their body, the length of their proboscis, their hairy legs, large eyes, and the breadth of their scale-covered wings. The mouth is a sucking organ, mandibles are rudimentary or absent, and the proboscis is formed by the maxillae, and in some species is 10 in. long. The legs are always weak, merely supplying supports during rest, and in some cases the front pair is rudimentary. The metamorphosis

of the insect is complete, but the life of the adult is usually very short, and seldom survives a single season, though sev. Brit. species, including the peacock and the small tortoise-shell, are able to hibernate in the adult form. The Nymphalidae is the largest of the B. families, and none of the species included in it are capable of walking on the front legs owing to their reduced state. To it belong 7 sub-families, and these include such well-known B.s as the grayling, Scotch argus, dead-leaf, fritillaries, admirals, purple emperor, and the genus *Vanessa*. The family Erycinidae has 2 subfamilies, and in Britain is represented by the Duke of Burgundy fritillary. The 'Blues' are small and slender B.s comprised in the Lycaenidae, the species of which are usually blue on the upper surface, but many are also copper, white, and yellow. The Pieridae is a family which has sev. Brit. genera, and among the best-known members are brimstones, orange-tips, clouded yellows, and garden whites or cabbage butterflies (q.v.). The difference in form and colour of the sexes in Papilionidae has led to a good deal of confusion among entomologists; the family has many members in S. America, and some of these are the most beautiful B.s in existence. The Hesperidae, or skipper family, is characterised by having perfect legs; like the Papilionidae it is world wide in distribution, but unlike that family its species have largish bodies of very dull colour; many have a jerky flight, but some are extremely rapid when on the wing. In habit they resemble moths, and many of them fly at twilight. Extensive migrations of B.s belonging to many species are known to take place. The large cabbage white (*Pieris brassicae*) and the small white (*P. rapae*), for instance, have been observed over the Channel and reaching the S. coasts of England from the European mainland, sometimes in such numbers as to resemble a huge cloud obscuring the sun. See also CABBAGE BUTTERFLY; CATERPILLAR; CHRYSALIS; COCOON; MOTHS. See F. W. Frohawk, *Natural History of British Butterflies*, 1924, and *The Complete Book of British Butterflies*, 1934; C. B. Williams, *The Migration of Butterflies*, 1930; E. Sanders, *A Butterfly Book for the Pocket*, 1939; R. South, *The Butterflies of the British Isles*, 1941; E. B. Ford, *Butterflies*, 1945 (where the literature is more fully quoted); Vere Temple, *Butterflies and Moths of Britain*, 1948; L. H. Newman, *Transformations of Butterflies and Moths*, 1953, and *Butterfly Farmer*, 1953.

Butterfly Flower, see *Scilla* ANTHUS.

Butterfly Orchis, or *Platanthera bifolia*, and *P. chlorantha*, are beautiful species of Orchidaceae; they are found in Britain.

Butterfly Weed, or Pleurisy Root, is the *Asclepias tuberosa*, a herbaceous plant of the family Asclepiadaceae. It is a native of the U.S.A., and was formerly used in cases of pulmonary affections and rheumatism.

Butterine, food product prepared by mixing purified animal fats with milk. By the Margarine Act of 1887 all such

substances are to be termed margarine (q.v.), and must be so labelled.

Buttermere, Cumberland, England, once one lake with Crummock Water, is 1½ m. in length by ¼ m. in breadth, and drains NW. It is 7½ m. SW. of Keswick, amidst superb scenery.

Buttermilk, the fluid residue after butter has been taken from cream. It is generally given to pigs as food, but makes an easily digested and nourishing drink. Some inferior kinds of cheese contain B.

Butternut is the name given to the fruit of the various species of *Caryocar*. It is a large drupe containing 4 seeds, and comes from tropical America. The term is also applied to the *Juglans cinerea*, the white walnut of N. America, the seeds of which are rich in oil.

Butters, Vegetable, substances having the consistency of butter, belong vegetable fatty oils which are nearly solid at ordinary temps. Examples are cocoa butter and butter of almonds.

Butterwort is the name applied to sev. species of *Pinguicula*, a genus of Lenticulariaceae. Three of these plants grow in damp places in Britain, and are noted for their carnivorous habits. The rhizome has a rosette of greenish-yellow leaves which grow close to the ground and are covered with numerous small hairs secreting a sticky fluid. Insects adhere to the leaves, and the acid secreted by the hairs decomposes the bodies and gives the plants the nitrogen they require. *P. vulgaris*, *P. alpina*, *P. lusitanica*, and *P. grandiflora* are the species which are found in Britain.

Butterworth, George (1885-1916), Eng. composer, b. London; killed at Pozieres in Somme battle. His first serious composition was *Barcarolle*, orchestral piece, written while still at Eton. He studied music at Royal College of Music and also privately, and took a leading part in the folk-song and dance movement. His *Shropshire Lad*, an orchestral rhapsody based on one of his Housman songs, raised high hopes which were frustrated by the war. His songs, *A Shropshire Lad* (6) and *Bredon Hill* (5), are regarded as among the finest in Eng. music. Compositions include *Two Folk-song Idylls*, 1912, *The Banks of the Wind Blows* (cycle of 4 songs), 1912, *Folk-songs from Sussex: Country Dance Tunes*, 1906-16, *The Morris Book*, 1907-13, and *We get up in the Morn.*, a part song.

Butterworth, firm of legal and scientific publishers, which can point to its foundation in the reign of Henry VII, when, under the sign of *The Hand and Starre* at No. 7 Fleet Street, it was known as a 'Law Book Shop and Printery'. In 1553 the then owner, Richard Totell, was granted a patent to publish 'all authorized books on common Law', and he was succeeded by his apprentice, John Jaggard, who held the copyright of Sir Francis Bacon's *Essays*, printed by his brother Wm Jaggard between 1603 and 1613. Wm made all arrangements for printing the First Folio of Shakespeare's

plays, completed by his son Isaac in 1623. The Jaggards were also responsible for printing such works as Sir Walter Raleigh's *History of the World*, and a trans. of *The Decameron*. The firm was acquired by Henry Butterworth in 1818, and by the end of the cent. when the move to Bell Yard took place, was already renowned for many of the legal titles which are familiar to-day. Under the ownership of Stanley Bond, such monumental works as Halsbury's *Laws of England* and the *Encyclopaedia of Forms and Precedents* were launched, and subsequently the publishing scope was enlarged to include the medical and scientific, as well as the legal field.

Buttevant, anct mrlkt tn in co. Cork, Rep. of Ireland, half way between Cork and Limerick. It has the remains of 13th-cent. Ballybeg (Augustinian) and B. abbey, and B. (Boutez on Avant) Castle. The word 'steplechase' originated in the race, O'Callaghan v. Blake, between B. and Donerale church steeples in 1752. There are limo-works, and the anct and world-famous horse fair of Cahirmee is held here. Pop. 1100.

Buttler, Walter, see BUTLER.

Buttmann, Philipp Karl (1764-1829), Ger. philologist, b. Frankfurt-on-the-Main. His fame rests on his *Griechische Grammatik*, 1792 (of which the 22nd ed. appeared in 1869), and his *Lexilogus*, 1818-25, which is a scholarly discussion of certain difficult words in Homer and Hesiod. Both these works have been trans. into English.

Button, Sir Thomas (d. 1634), entered the navy in 1589, but did not rise to renown until in 1612 he was given the command of an expedition whose objective was the search for the NW. passage. Accompanied by the pinnace *Discovery*, and himself captain of the *Resolution*, he explored the coasts, especially the W. coast, of Hudson Bay for the first time, and proved conclusively that the hoped-for passage did not exist. It was he who named the Nelson R., New Wales, and Button's Bay. Deficiency in equipment caused a high mortality among the crew. Later B. was admiral of the king's ships off Ireland, and did yeoman's service in suppressing piracy. Various disputes with the Admiralty, in which he was supported by the Duke of Buckingham, embittered his closing years.

Buttons (Fr. *bouton*, from same root as Fr. *bouter*, to push). The practice of passing a loop of material over a button dates certainly from the Dark Ages, and is probably of much greater antiquity: early Dan. mantles have been discovered that have fastenings of this kind. The practice of attaching rows of B. to one side of a piece of material and of making corresponding 'button-holes,' through which they can be passed, on the opposite side, is, however, much more recent, and dates probably from the late 12th cent. By the middle of the 14th cent. long rows of B. had become so popular in Italy that in at least 2 cities, Lucca and Florence, sumptuary laws were passed forbidding servant girls to wear sleeves

buttoned above the elbow on pain of being whipped naked through the streets.

From the middle of the 16th cent. onwards ornamental B. have been made in various ways: sometimes a hard core has been covered with fabric, and often embroidered; other kinds of B. have been made in hard materials such as bone, metal, mother-of-pearl, vegetable ivory (q.v.), and various chemical compositions. A fashion for wearing enormous cut-steel or paste-set gilt B. down the front of the coat was adopted by men in the late 18th cent., and on its first introduction was much lampooned in contemporary engravings.

Other methods of fastening clothes, such as hooks-and-eyes, 'patent' fasteners, and zip fasteners, have been introduced from time to time and continue to be used, but the fact that B. can be decorative, are easy to fasten, and hold securely has meant that since their first popularity they have never disappeared from the fashion. The chief centre of the button-making industry in England is Birmingham.

Buttress (O.F. *boutrez*, from *bouter*, to thrust), in architecture, a vertical mass of masonry projecting from the outer face of a wall at intervals, to resist the outward thrust of a vault, roof-truss, or girder. B.s were seldom used in classical architecture; and in Romanesque architecture were of slight bulk and projection; but in the Gothic period they were progressively increased in size, thus enabling the intervening wall to be reduced in thickness and to be pierced with large windows.

Butuntum, see BITONTO.

Butyl Alcohol, one of the isomeric alcohols of the general formula C_4H_9OH . There are 2 primary, 1 secondary, and 1 tertiary forms. Normal B., A., $CH_3(CH_2)_3OH$, is a colourless liquid prepared by reducing normal butyl aldehyde with hydrogen and reduced nickel. Iso-butyl alcohol, $(CH_3)_2CH-CH_2OH$, is a disagreeably smelling liquid occurring in fusel oil. The secondary alcohol, methyl ethyl carbinol, $CH_3(OH)CH_2OH$, is a strongly smelling liquid boiling at 98° C. The tertiary alcohol, trimethyl carbinol, $(CH_3)_3COH$, is a crystalline solid prepared by the action of zinc methyl on acetyl chloride.

Butyl Chloral, $CH_3CHCl.CCl_3CHO$, oily liquid prepared by the action of chlorine on acetaldehyde. It readily unites with water to form B. C. hydrate, $C_4H_9Cl_2O.H_2O$, a crystalline solid used in medicine as an analgesic. It has similar properties to chloral hydrate, in the manuf. of which it occurs as a by-product.

Butyric Acid, $CH_3CH_2CH_2CO_2H$, volatile fatty acid occurring in butter fat, in parsnip and other vegetable oils, and in the perspiration of animals. It is an oily colourless liquid with an unpleasant smell, solidifies at -10° C., boils at 162.3°, and has a sp. gr. of .974. It is miscible with water and alcohol, and forms salts and esters called butyrates. It may be prepared by adding putrid cheese to sugar or starch mixed with

water, the cheese introducing the bacillus by whose agency the acid is formed. Chalk is usually added to bring off the acid in the form of the calcium salt.

Isobutyric acid ($\text{CH}_3\text{CH}_2\text{CO}_2\text{H}$), isomeric form found in some vegetable oils. It has an unpleasant smell, boils at 155°C ., and has a sp. gr. of .968.

Butyric Ester, or **Ethyl Butyrate**, liquid obtained by distilling butyric acid, alcohol, and sulphuric acid. Unlike butyric acid it has a pleasant smell resembling that of pineapple. It is commercially known as pineapple oil, and is much used as a flavouring agent for sweets, etc.

Butyrin, $\text{C}_8\text{H}_{16}(\text{C}_4\text{H}_7\text{O}_2)_3$, yellowish liquid with a bitter taste which forms about 3.8 per cent of butter fat. It is the glyceryl ester of butyric acid.

Butzer, Martin, see BUCER.

Bützow, Ger. tn in the dist. of Schwerin, on the Warnow, 27 m. N.E. of Schwerin (q.v.). It is a mkt. tn, and has chemical and paper manufs. Pop. 9000.

Buxar, tn situated on the S. bank of the Ganges in Bihar state, India. Here Mir Kasim was defeated by Sir Hector Munro, 1764. It is of literary interest as the residence of writers of Vedic hymns, and is the centre of pilgrimage as the site of one of Rama's exploits as told in the *Ramayana*.

Buxbaumia, *Buxbaumia* or *B. aphylla*, is a moss of the family Buxbaumiaceae. It was named in honour of Buxbaum, the Ger. botanist, and is a rare plant occasionally found in Britain.

Buxina, alkaloid occurring in the common box-tree (*Buxus sempervirens*).

Buxtehude, Diderik (1637-1707), Dan. composer and organist, b. Helsingør, organist of the Marienkirche, Lübeck, from 1668. As organ composer and player he had a great influence on J. S. Bach (q.v.), who made a 200-m. journey on foot to hear him play. He composed many works for the organ, trio sonatas for violin, gamba, and continuo, and a number of church cantatas. He d. at Lübeck. See lives by Niels Friis, A. Pirro, and H. J. Moser, and W. Stani, *Franz Trunder und Dietrich Buxtehude*, 1926.

Buxton, Jedediah (1704-74), calculator, b. Elmlton, Derbyshire, who could work out the most elaborate problems in number, although he never mastered any arithmetical rules. By striding over the estate of Elmlton, he gave its area accurately in ac., roods, etc., and even sq. in. At a performance of *Richard III.*, his one amusement was to count the words Garrick uttered. Another time he expressed in pounds, after mental reckoning only, the product of a farthing doubled 139 times. His result of 39 figures is correct, as verified by logarithms.

Buxton, Sydney Charles, 1st Earl, of Newtimber, Sussex (1853-1934), statesman and author. He was educ. at Clifton and Trinity College, Cambridge. He first entered Parliament as a Liberal in 1883. He was a member of the Royal Commission on Education, 1886-9, and a member of the Income Tax Committee in 1904. From 1892 till 1895 he was under-secretary for the colonies. From 1905 to 1910

he was postmaster-general, and instituted the Canadian magazine post, 1907, and the penny post to the U.S.A., 1908, and acquired the first wireless telegraph station for the post office, 1909. In 1910 he became president of the Board of Trade, and was the author of the 'fair wages' resolution of the House of Commons: a resolution requiring a clause to be inserted in all gov. contracts to secure better payment for workers engaged in such work. In 1914 he was made a viscount, and he was high commissioner and Governor-General of S. Africa, 1914-20. He received his earldom in 1920. His pubns. include *Political Manual*, 1886, and *The Fiscal Question: Handbook of Political Questions*, 1904.

Buxton, Sir Thomas Fowell (1789-1845), philanthropist, b. Earl's Colne, Essex. He was a brilliant student at Trinity College, Dublin, in spite of his very meagre grounding in academic work. In 1808 he entered Messrs. Truman & Hanbury's brewery. So wholehearted was his devotion to business that he became a partner in 1811. His wife, Harriet Gurney, was a sister of Elizabeth Fry (q.v.). People first recognised his talent as a speaker and his disinterested enthusiasm in his speech for the Spitalfields weavers, 1816. From 1818 to 1837 he represented Weymouth in Parliament, his sturdy opposition to bribery being responsible for the loss of his seat. Though he sacrificed many hours to the question of prison reform, and tried to carry a scheme for bettering the condition of the African Negroes, his life work was to promote emancipation of slaves throughout Brit. dominions. In this cause his activities were never relaxed, and he proved himself a worthy successor to Wilberforce as leader of the anti-slavery party, 1824. See R. H. Mottram, *Buxton the Liberator*, 1946.

Buxton, holiday resort and spa treatment centre in Derbyshire, England, 34 m. NW. of Derby, and 163 m. NW. of London by rail. It is the highest tn in England, 1000 ft. above sea level, the centre of the Peak dist. national park, and is remarkable for its very bracing climate. It is well known as a holiday centre. It has long been famous for its mineral waters, which were found and used by the Romans. The springs supply over a quarter of a million gallons of water daily at a constant temp. of 82°F . The physical treatment centres situated in the Crescent are the property of the corporation, and the Devonshire Royal Hospital is the regional rheumatism and rehabilitation centre for the Manchester area. There are excellent hotels and entertainment facilities. Pop. 19,600.

Buxtorf, Johann (1564-1629), Ger. Heb. scholar, prof. of Hebrew at Basel in 1591. In his devotion to rabbinical literature he has hardly been surpassed. His reputation depends chiefly on his *Lexicon Chaldaicum, Talmudicum, et Rabbinicum*, and his *Concordantiae Bibliorum Hebraicorum*, both of which were pub. by his son, but his greatest work perhaps was his folio Heb. Bible, to which were added the

Aramaic paraphrases, or Targums, and the commentaries of Ibn Ezra, Rashi, and others, 1618. His son Johann B. (1599-1664), also a great Hebraist, succeeded him as prof. at Basel.

Buxus, genus of dicotyledonous plants of the family Buxaceae, of which the common name is box (q.v.).

Buxwiller, see **BOUXWILLER**.

Buya-Ballot, Christoph (1817-90), Dutch meteorologist, b. Kloetigen in Zealand; studied at Utrecht, where he became prof. of mathematics, 1847, and of experimental physics, 1870, and in 1854 director of the Royal Meteorological Institute. He invented the aeroklinoscope and a system of weather signals which were a great aid to international uniformity in meteorological observations. His observations have been formulated in a general law of storms which may be put thus for the N. hemisphere, 'Stand with your back to the wind; the low-pressure area will be on your left hand. For the S. hemisphere the reverse will obtain.' This is known as B.'s law. His works include *Changements périodiques de la température*, Utrecht, 1847, and in English, *Suggestions on a Uniform System of Meteorological Observations* (1872-3).

Buzançais, Fr. tn in the dept of Indre, on the Indre. It manufs. textiles. Pop. 4500.

Buzău, in the prov. of Ploesti in Rumania, 42 m. NE. of Ploesti; the seat of a bishop, and a market for grain, timber, and petroleum. Pop. (1948) 43,000.

Buzzard is the name given to sev. genera of birds of prey of the falcon family, Falconidae, to which belong also the kites. The species usually live on such small animals as mice, but they are known to carry off domestic fowls. They are cosmopolitan but for Australia. *Buteo vulgaris*, the brown or common B., and *Buteo lagopus*, the rough-legged B., are the only natives of Britain. *B. lineatus*, the red-shouldered hawk, and *B. borealis*, red-tailed hawk, occur in N. America. *Pernis ptilorvus*, the honey B., belongs to a different sub-family from *Buteo*, while *Cartharus aura*, the turkey B., is an Amer. vulture.

Buzzard Clook, see **DOR-BEETLE**.

Buzzard's Bay, large inlet (30 m. long, 5-10 m. wide) of the Atlantic Ocean on the SE. coast of Massachusetts, U.S.A. New Bedford, the cap. of Bristol co., stands on the estuary at the mouth of Acushnet R., which falls, with other small streams, into this bay. The vil. of B. B. (pop. 1460) is a business centre and the seat of Cape Cod Canal administration.

Buzzer, device resembling the electric trembler bell with the gong removed. It is used to produce the excitation of an oscillatory circuit at its natural frequency. If the circuit has been calibrated in frequency the attachment of a B. transforms it into a B. wave-meter, convenient for calibrating the tuning circuits of a receiver.

By, John (1781-1836), engineer and founder of Bytown, now Ottawa. He was a lieutenant-colonel in the Royal Engineers, and served in the Peninsular

war. He constructed the Rideau Canal, 1827-32, in Canada, joining Lake Ontario with the Ottawa R., a defensive measure against Amer. invasion. It is still used for pleasure boats.

Byblos, or **Byblus**, anct city of Phoenicia, the traditional bp. of Adonis. See **JEBAL**.

Bydgoszcz: 1. Prov. (*województwo*) of central Poland, in the Vistula (q.v.) basin. Until 1949 it was called Pomorze (q.v.). Area 8100 sq. m.; pop. 1,500,000.

2. (Ger. *Bromberg*), tn of Poland, cap. of B. prov., on the Brda, a trib. of the Vistula (q.v.), 140 m. WNW. of Warsaw (q.v.). A canal and the R. Noteć connect it with the Odra (q.v.). There are engineering, textile, chemical, and paper industries. Pop. 200,000.

Byelorod, see **BEŁGOROD**.

Byelostok, see **BIELYSTOK**.

Byfleet, par. and vil. in NW. Surrey, England, 22 m. from London. Pop. 4500.

Byland Abbey, Cistercian abbey in Yorks, 6 m. from Easingwold, transferred from Old Byland (5 m. N.) in 1177. The ruins were given to the nation in 1920 by Lady Julia Wombwell.

By-law, or **Bye-law**, is 'an ordinance affecting the public or some portion of the public, imposed by some authority clothed with statutory powers, ordering something to be done or not to be done, and accompanied by some sanction or penalty for its non-observance. It involves this consequence that, if validly made, it has the force of law within the sphere of its legitimate operation' (Lord Russell, C.J., in *Kruse v. Johnson*, 1898). B.s are generally made by councils, corporations, and companies for the control of order and good gov. within some jurisdiction. B.s are binding, unless contrary to the laws of the land, or to the act of any corporation, or unless they are obviously unreasonable. The power of B.s extends to taxing, licensing, and the regulation of amusements. Fines and forfeitures may also be enforced by B.s. Corporate bodies also are empowered by their charters to make B.s which are binding on their members. Every corporation can of necessity repeal or alter any B. made by itself. By various statutes powers are given to bor. and co. councils to make B.s for the good gov. of their area. Dist. councils can only make sanitary B.s. Such B.s are not enforced until after the expiration of 40 days, or till a copy has been sent to a secretary of state, who has power to disallow or alter the B.s. B.s must generally be submitted to some confirming authority for sanction and approval. For example, the Ministry of Transport regulates traffic on railways and tramways, the Ministry of Education makes B.s compelling attendance at school, the Ministry of Housing and Local Gov. regulates, by means of B.s, the use of public baths and washhouses, lodging-houses, and slaughter-houses. Local authorities are apt to encroach on the powers of the central depts of state by arbitrary use of B.s. This tendency can be checked to a certain extent by the confirming authority of the appropriate gov. dept, e.g. the B.s of co. councils must

obtain the assent of the Ministry of Housing and Local Gov., and those of a bor. corporation may be opposed by the Privy Council, while the courts also have power to pronounce on the reasonableness or otherwise of B.s. B.s may also be made by societies, guilds, and companies. See LOCAL GOVERNMENT.

Byng, George, Viscount Torrington (1663-1733), admiral, *b.* Wrotham, Kent; went to sea at 15; was made captain by the Prince of Orange in 1688, and in 1703 became rear-admiral of the Red. In 1704 he served under Sir Cloudesley Shovell, and distinguished himself at Gibraltar, and was knighted by Queen Anne for gallantry at Malaga. In 1708 he was made admiral of the Blue and defeated the Fr. Fleet of the Old Pretender; in 1715 served against the French in the Downs and was made a baronet; in 1718 dispersed the Sp. Fleet off Messina, and was appointed treasurer of the navy and rear-admiral of Great Britain. In 1721 he became a Privy Councillor, Baron Southhill and Viscount Torrington; in 1725 a Knight of the Bath, and in 1727 First Lord of the Admiralty.

Byng, John (1704-57), admiral, son of Lord Torrington. His father used his influence to further the interests of his son. The result was that B. received rapid and not altogether merited promotion. He entered the navy in 1718, became a captain in 1727, a rear-admiral in 1746, a vice-admiral in 1747, and an admiral in 1755. In 1756 he sailed from Gibraltar to relieve a garrison that was besieged in St Philip in Minorca. He fought an ineffective naval battle with the French, hung round Minorca for a few days, and then returned without having done anything. The fort surrendered, and B. was brought home, tried by court-martial, and executed for not having done his utmost.

Byng of Vimy, Julian Hedworth George, 1st Viscount (1862-1935), Brit. soldier, seventh son of the 2nd Earl of Stafford. He began army life as a subaltern in the 10th Hussars, 1883, reaching the rank of lieutenant-general, 1916, and full general 1917. He served in the Sudan expedition, 1884, and in the S. African war, 1899-1902, being mentioned in dispatches. During the greater part of the First World War B. commanded the Canadian Corps, and his outstanding successes were the capture of Vimy Ridge on 9 April 1917 by his Canadian troops; the execution of a brilliant piece of work in Nov. 1917 near Cambrai; and his resistance to the Germans in their spring attack of 1918. Later, when the allied armies began the final advance to victory, B.'s army broke the Hindenburg line (*q.v.*). Created Baron B. of Vimy of Thorpe-le-Soken, 1919. Governor-General of Canada, 1921-6. During his period of office he came into conflict with Mackenzie King, leader of the Liberal party. His action in dissolving the Canadian Parliament in 1926 was severely criticised. He was created a viscount, 1926. Commissioner of the Metropolitan Police, 1928-32, in which latter year he was made a field marshal.

Bynkershoek, Cornelius van (1673-1743), Dutch jurist, *b.* Middelburg, Zeeland; studied at the univ. of Franeker, and took a doctor's degree in 1694, settling down to an advocate's practice at The Hague. In 1703 he became a member of the Supreme Council of Holland, Zeeland, and W. Friesland, and in 1742 became its president. Author of numerous works on international law.

By-pass Condenser, capacitor used to separate alternating currents from direct currents. The capacitor (*q.v.*) has infinite resistance to direct currents, as there is no conducting connection between the plates, and thus bars passage of direct currents. On alternating currents the plates are continuously charged up in alternating directions; the resistance is zero.

By-pass Valve (engineering), valve by which the flow of a fluid in a system is carried past some particular plant in operation. It is fitted in a pipe connecting the pipes leading to and from the plant and is normally closed. Where a fluid is passed through a number of filters, a B. V. is usually provided at each filter, so that any filter may be opened up for cleaning without interfering with the flow in the system.

By-products, goods of commercial value which occur in the manu. or preparation for the market of some other commodity which is looked upon as the main product. B. have always been considered in the economic adjustment of agric. and pastoral enterprises, but it is only within recent years that their great importance in various forms of manu. has been recognised. B. not only mean additional profit in the ordinary course of a particular business, but they also represent a means of insurance, or of levelling up the various risks; for it often happens that the markets supplied by the different products are independent, so that the dangers of a movement disastrously affecting the value of one product may be counteracted, or at any rate mitigated, by a profitable treatment of another. It may thus happen that what was considered the main product at the beginning of an enterprise may become secondary, and a former by-product may become the prin. article dealt with. Where B. have gained enhanced importance in this way it is more convenient to speak of all the marketable goods as joint products. At the present time, when chemical science enables us to treat profitably what were formerly called waste products, and when businesses design to keep many stages in the production of an article under one control, the treatment of B. makes the question of estimating costs and values an important one. The matter is fairly simple when the various products occur in a fixed and invariable ratio of quantity and quality, because the total income will be the sum of the amounts realised by each of the joint products, and an increased outlay should bring profits in roughly the same proportion. It occurs much more often, however, that certain products may be developed at the expense of others, either as regards quantity or quality. A

farmer, for instance, may rear sheep principally for meat or principally for wool, but also with a view to profiting by both. His methods will vary according to which he regards as the main product, and it may be a matter of somewhat nice adjustment to arrive at the more profitable of the 2 courses. The farmer would no doubt decide from experience, and might even experiment with different breeds and in different seasons. The case of the big manufacturing concern is often much more complex. Where the B. are numerous and valuable, it may be that the correct adjustment of the proportions of the cost allotted to the various products may make the difference between success and failure. That is to say, the particular advantage which enables a business to operate as a profit-making concern, and to keep its place among its competitors, may be the development of a by-product in a particular way. Sometimes the retention or disposal of a waste product is more expensive than its conversion into something marketable, or may constitute such a nuisance that the legislature insists upon a new method of disposal. An instance of the latter is supplied in the Leblanc process of alkali manuf.: the hydrochloric acid generated was formerly allowed to escape into the atmosphere with some danger to public health, and the manufacturers were consequently compelled to dissolve it in water in the acid towers. An interesting feature of the compulsory change was that the old Leblanc process could compete with more modern processes only in virtue of the profit gained by the sale of what was formerly a noxious waste product. However, as a process for the manuf. of soda, the Leblanc process has now been superseded by the ammonia-soda process.

Some important by-products. In the alkali process already referred to, another former waste product, 'alkali waste,' composed mainly of calcium sulphide, was treated for the recovery of the sulphur. In most chemical works an effort is made to utilise or render marketable all the products of the chemical action; the pyrites burnt in sulphuric acid manuf. is treated to recover the copper and iron. Soap works produce glycerine, which is often purified for sale by the soap manufacturers themselves. Brewing yields an excess of yeast which is sold to bakers and others, and the spent malt is prepared as a cattle food. In the great canning industries of the U.S.A. all the animal products—hide, hair, bones, horns, hoofs—are dealt with as near the factory as possible. Molasses and syrup are B. of the sugar industry. The oil-cake produced from the pressed seeds in linseed-oil factories is used as a cattle food. In gas-works the most notable of all illustrations of the utilisation of B. occurs. Not only is the coke sold for fuel, but the liquid or coal-tar produced during the dry distillation of coal yields a variety of useful products. When subjected to fractional distillation, benzene derivatives are separated which are the basis of many different dyes, drugs used medicinally, flavouring

agents and volatile benzols which are used as solvents and motor fuels. The ammoniacal liquor is worked up into ammonium sulphate for use as a fertiliser and formerly represented a considerable revenue. Its value as a by-product has practically disappeared owing to the extensive production of synthetic ammonia by nitrogen fixation processes. Thus some apparently waste products become valuable B., while others, once valuable, become of little account. One example may be given: as mentioned above, in the early days of the Leblanc process, it was helped considerably by the value of the by-product hydrochloric acid, while in the early days of the electrolytic process for soda compounds chlorine was a great nuisance. To-day the situation is reversed. Hydrogen and chlorine are important B. from the electrolysis of brine by the Castner-Kellner process for the manuf. of caustic soda. The B. are used for making hydrochloric acid and bleaching powder. Both germanium and selenium are extracted from the fine gases of certain industries and radium and uranium are B. from the extraction of vanadium from carnotite. Precious metals such as silver, platinum, and gold are recovered profitably from the refining of copper and lead. Calcium chloride is a by-product from the Solvay process for the manuf. of sodium carbonate, and being hygroscopic is used on roads to keep the dust down. Calcium silicate, a slag formed in many industrial processes, is often used for bedding in roads. The fermentation of sugars gives alcohols as the main product with carbon dioxide as the by-product which is used for refrigeration, etc. A more recent example is the production of sulphur from the bacterial reduction of sulphates in sewage.

Byrd, Richard Evelyn (1888-1957). Amer. explorer, b. Winchester, Virginia, second son of Richard Evelyn B., lawyer, member of an old Virginian family. It appears that when he was 12 he visited the Philippines, and there learned to rough it. He was educ. at Shenandoah Valley Military Institute, Virginia Military Academy, and univ. of Virginia. As a result of 2 accidents—one at football, the other in a gymnasium—he became lame in his right leg; yet he graduated at U.S. Naval Academy, 1912, and became an ensign in the U.S. Navy. He was employed on suitable duties, rose through various grades to lieutenant-commander, and, on account of his leg, was retired on three-quarter pay, 1916. He began aviation at Pensacola in 1917, and joined the U.S. Air Force, and was given command of 2 U.S. bases in Canada. He next entered the aviation unit of the MacMillan polar expedition of June to Oct. 1925; and then, in a Fokker 3-engine monoplane with 200-h.p. Wright air-cooled motors, accompanied by Floyd Bennett, he flew to the N. Pole and back to his starting place, King's Bay, Spitsbergen, on 9 May 1926, covering 1380 m. in 15½ hrs. He was then raised to the rank of commander. He also flew from New York to France in 42 hrs. 29 June to 1 July 1927. Flew over S.

Pole, 1929. Explored Antarctic (q.v.), 1935. In 1939 he was made commander of U.S. Antarctic service, an expedition by the gov. to the Antarctic. Patron's medal, Royal Geographical Society, 1931, congressional and 2 special congressional medals, and many other awards. In 1946-7 he led an Antarctic expedition, 'Operation Highjump,' consisting of 13 vessels, including the flagship *Mount Olympus*, an ice-breaker, a seaplane tender, and a destroyer. The expedition carried out an extensive programme of air reconnaissance over much of the continent and photographic flights over part of it. B. flew over the S. Pole for the second time. The central group was based on 'Little America.' He was made head of U.S. Antarctic Programs (Washington) in 1955 in order to organise, though not to lead, the very large U.S. Antarctic expedition for the International Geophysical Year (1957-8), known as 'Operation Deepfreeze,' which estab. bases at points on the coast and continent and at the S. Pole. Pub. *Little America: Aerial Exploration in the Antarctic*, 1931, *Discovery*, 1935, *Exploring with Byrd*, 1937, and *Alone*, 1938. See also ANTARCTIC EXPLORATION.

Byrd, William (1543-1623). Eng. musical composer, b. probably in Lincs and d. probably on his estate at Stondon, Essex, describing himself in his will as being 'in his eightieth year.' According to Anthony Wood, B. was 'bred up to music' under Thomas Tallis, a gentleman of the Chapel Royal. About 1563 he was appointed organist of Lincoln Cathedral. In Elizabeth I's Chapel Royal he shared the post of organist with Tallis, and in 1575 the 2 composers secured a licence giving them the sole right to print and sell music. In that year they pub. a collection of Lat. motets for 5 and 6 voices; but the monopoly would not appear to have been very remunerative. About 1581 B.'s name figures in lists of recusants, and though he remained at the Chapel Royal he was all his life a Catholic. In 1588 he pub. *Psalmes, Sonets, and Songs of Sadnes and Pietie* and in 1589 *Songs of Sundrie Natures*—of which a second ed. was pub. in 1610—and *Liber Primum Sacrarum Canticorum* in 2 series. B. was the earliest Eng. composer of madrigals and most of them were pub. in his lifetime. Two of them were included in Thomas Watson's *First Set of Italian Madrigalls Englished* in 1590. At about this time he became involved in a long law-suit over the lease of the property of Stondon Place, which had been the estate of one Wm Shelley from whom it had been sequestrated on conviction for treason. B. was upheld in possession by James I, even though it had been confiscated by a recusant and even though B. himself had been excommunicated. In 1607-14 he pub. *Psalmes, Songs and Sonnets: some solemn, others joyfull; Parthenia*, a collection of virginal music (in collaboration with John Bull (q.v.) and Orlando Gibbons (q.v.)); and 2 books *Gradualia* in 1607, of which a second ed. was issued in 1610. In addition to the above works B. also composed 3 masses, for 3, 4, and 5

voices respectively, pub. about 1588. All of them have appeared in modern eds. and enhance B.'s claim to rank as one of the great composers of all time. He composed sacred music and secular choral music of the highest quality, in some instances reaching the sublime. He was one of the founders of the Eng. madrigal school and was a madrigalist of charm and individuality, though opinions differ on whether he was in this respect the equal of Gibbons, Thomas Morley, or John Wilbye. He wrote with equal inspiration Lat. motets for the Rom. and Eng. anthems for the Anglican Church. See lives by Frank Howes, 1933, and E. H. Fellowes, 1948.

Byrd, William (1674-1744). Amer. statesman and historian, b. Virginia. He went to England and studied law at the Middle Temple, but in 1692 returned to Virginia, where he was immediately elected to the House of Burgesses. In 1709 he became a member of the Council of State, and had a long struggle with Alexander Spotswood, the lieutenant-governor, who endeavoured to reduce the power of the council. In 1728 he was one of the commissioners appointed to make out the dividing line between Virginia and N. Carolina, and wrote an account of the operation in 'The History of the Dividing Line.' This work, together with his other writings 'A Journey to the Land of Eden' and 'Progress to the Mines,' was pub. in 1841 as *The Westover Manuscripts*. B. also kept a private diary, which was ed. in 1941. See R. C. Beatty, *William Byrd of Westover*, 1932.

Byrgius, Justus (1552-1633), inventor of various astronomical instruments, was b. Lichtensteig, canton St. Gall, Switzerland. He served under William IV of Hesse and Emperor Rudolf II. His first work was a celestial globe on which the stars were placed according to his own observations.

Byrlaw, name given to a sort of popular jurisprudence formerly in use in Scotland, in vils., and among husbandmen. As the B. was formed by common consent of the villagers or neighbours, so it was administered by judges chosen from among and by themselves. These judges were called 'B. men,' a phrase later in use in parts of Scotland to denote a judge or umpire.

Byrne, Donn (Brian Oswald Donn-Byrne) (1889-1928), novelist, b. New York. He wrote 3 vols. of short stories and 11 novels, the best of which are about Ireland. He estab. his reputation with *Messer Marco Polo*, 1922. Others of his novels are *The Wind Bloweth*, 1922, *Blind Raftery*, 1924, *Hangman's House*, 1926, *Brother Saul*, 1927, and *Destiny Bay*, 1928. B. was killed in a motor accident. There is a biography by Thurston Macaulay, 1930.

Byrnie, shirt of mail (A.-S. *byrne*), reaching first to the knees, later only to the hips, with wide, short sleeves. Worn by auct. Eng. and Scandinavian warriors.

Byrom, John (1692-1763), poet and stenographer, b. Manchester. He was educ. at Merchant Taylors' and Trinity College, Cambridge, of which he became

a fellow in 1714. In the same year he contributed to the *Spectator*, as 'John Shadow,' 2 papers on dreams, and also his first poem, a pastoral entitled *Colin and Phoebe*. He resigned his preferment in 1716 and went to Montpellier to study medicine, returning in 1718. In 1721 he married his cousin, Elizabeth B., and under pressure of necessity began to teach an improved system of shorthand in Manchester and afterwards in London. In 1740 he came into possession of the family estate at Kersall, gave up teaching, and employed his time in versifying a genial satire on topics of the day. He was a friend of John Wesley, but in 1729 he



LORD BYRON

became a disciple of John Law and an ardent High Churchman. His epigram, 'God bless the King, I mean the Faith's Defender,' shows that he was a Jacobite in his political sympathies. The Chetham Society pub. his remarkable *Diary and Remains*, 1854-7, and his poems, 1894-5.

Byron, George Gordon, 6th Baron (1788-1824), b. London, son of Capt. John B. of the Guards, grandson of Adm. John B. (q.v.), and great-nephew of the 5th Lord B., who was usually designated the 'wicked lord.' The future poet was descended from a stock who had for generations past been noted for the looseness of their living and their lack of morals. Especially were these traits emphasised in the character of the father of the poet. B. was the son of the second marriage of Capt. B., his mother being Catherine Gordon, of Gight in Aberdeenshire, an heiress whose fortune her husband squandered. B.'s early life was passed in Aberdeen, where he also received the first part of his education, and where he

imbibed his love for the grandeur of mt scenery, and also his knowledge of the Scriptures, a knowledge which he tells us he received at the hands of his nurse, May Gray, to whom he was devotedly attached. The future poet, who was b. with a malformation of his feet that rendered walking distinctly arduous, could not roam about the country as he would have wished, but still seems to have spent a good deal of his time in the open. He was sent for sev. seasons to the neighbourhood of Ballater. In May 1798 his great-uncle d., and B. succeeded to the title and the estates. He and his mother immediately came S. from Aberdeen and took up their residence at Newstead. From this place B. was sent to a preparatory school at Dulwich, and later, in April 1801, he entered Harrow. There he stayed for 4 years, his greatest contemporary being Sir Robert Peel; his school work showed no signs of brilliance and his reading was desultory, but his strongest point was his declamation. His friendships at school, he tells us, were passions, and altogether he was a very unusual kind of boy. He was known throughout the school as the ringleader of any possible mischief, and yet he was at other times serious and thoughtful beyond his years. His lameness prevented his giving full vent to his passion for active games, yet he made a reputation as a swimmer, and he also played cricket. During his schooldays he had his first *grande passion*, the object of it being Mary Chaworth, a distant relative and his senior in age. His first love, he tells us, was an abiding attachment on his part, and certainly a number of his early poems have his object of adoration as their theme. In Oct. 1805 he entered Trinity College, Cambridge, but his residence there is simply one long record of high living, though he formed friendships and attachments there which were worthy of his future greatness. During the year 1806 appeared the first of his juvenile poems, *Hours of Idleness* appeared in 1807 and *Poems Original and Translated* in 1808. The adverse criticism which the *Edinburgh Review* gave to his *Hours of Idleness* provoked the pub. in Mar. 1809 of *English Bards and Scotch Reviewers*, which satirised the editor (Jeffrey) and the patron (Lord Holland) of the *Edinburgh Review*, but is chiefly concerned with the bards, both those he admires and those he despises. Coming of age in 1809, he immediately decided to fulfil the project which he had long had in mind of taking a prolonged tour in the E. He had already taken possession of his inheritance, and had also taken his seat in the House of Lords. Now, together with Hobbhouse, his closest friend, he set out for a prolonged tour which lasted for about 2 years. He left England in July 1809, and returned in July 1811. *Childe Harold's Pilgrimage* describes more or less accurately the events of the first year of his travels. He visited Spain and Portugal, from thence he proceeded via Malta to tour Albania and Greece. In the next year he visited Asia Minor and later Constantinople.

The second year of travel is not so well known as the first, but during it the first 2 cantos of the *Childe Harold* were written, as were also the *Hints from Horace* and *The Curse of Minerva*. These poems were pub. on his return to England in July 1811. In the meantime his mother had d., and although he did not entertain whilst she lived a high affection for her, his grief on her death was very real. The pub. of his new poems on his return to England, and his general prominence, for on his return he took an active part in political work in the House of Lords, made him the hero of the country. He could go everywhere, he was received rapturously wherever he went, his fame sprang into existence apparently in a single night—or, as he himself says, he 'awoke one morning and found himself famous.' He was known as a rising statesman too. His output of poetry still continued to be great; in the year 1813 he pub. *The Giaour* and *The Bride of Abydos*, and wrote *The Corsair*, which was pub. at the beginning of the next year. The poems increased an already great reputation. In 1813 he again met his half-sister, Mrs Leigh, and if the stories which were currently believed are true, the new influence was not altogether for good; it is in any case well known that he always had a greater affection for his half-sister than for any other person. He was now at the height of his fame, he was the lion of society, and he had permanently estab. his reputation as a poet. He still continued to write, and in 1814 appeared the stanzas on the abdication of Napoleon, and the sequel to *The Corsair*, *Lara*. In the same year he engaged himself to Anne Isabella Milbanke, the heiress to a peerage in her own right, and his marriage to her took place in the Jan. of the following year. Husband and wife finally settled down in Piccadilly Terrace, London. From his correspondence, the early days of his marriage seem to have been spent quite happily, but there is no doubt that his conduct was often eccentric, even to the verge of madness. He wrote but little poetry. *Hebrew Melodies* appeared in April 1815. Almost immediately after the birth of their child, Lady B. fled from her husband's house and claimed the protection of her father, and the couple separated. The exact reason for the separation is unknown. The work *Astoria*, pub. in 1805, attempted to prove the charge of incestuous intercourse with Mrs Leigh, whilst *Byron, the Last Phase*, 1909, by Robert Edgecombe, defended the poet on that charge. The separation was the talk of London for a considerable time, and B. came rapidly down from his high position. He was now the most unpopular man in tn. He fled from social ostracism, and immediately the articles of separation were signed he started on a European tour. He spent the early part of his tour with Shelley, and his poetry pub. at this time shows obviously the influence of Wordsworth, which had affected him through Shelley. Among the poems written in 1816-17 were *Siege of Corinth*, *Parisina*, *Prisoner of Chillon*

(and other poems), the third canto of *Childe Harold's Pilgrimage*, *Monody on the Death of Sheridan*, *Manfred*, and *Lament of Tasso*. From 1816 to 1819 B. who was accompanied by Hobhouse, lived near Venice. His life at Venice was one long deliberate attempt to forget the past in an orgy of profligacy, but during the whole of the time his active mind was at work, and he was continually busy with his poetry. The fourth canto of *Childe Harold* was worked up at this time, and pub. in 1818, and in the Sept. of the same year he started *Don Juan*. The process of his composition and of the pub. was slow. Cantos i and ii appeared in 1819, iii, iv, and v in 1821, and cantos vi-xiv in the years 1823-4. *Don Juan* was intended to be his great poem with a plan setting forth the ideas, morals, and principles of his school of poesy. In 1819 also had appeared *Mazeppa* and an ode on Venice. In 1819 B. met an It. countess, Teresa Guiccioli, who for the next 4 years remained B.'s mistress, and was rewarded with his fidelity and constancy. He was politically the friend of freedom, the champion of liberty on the Continent, and on the Continent he earned both influence and power. In 1819 B. left Venice and went to Ravenna. Here in 1821 appeared *Sardanapalus*, *The Two Foscari*, and *Cain* (pub. together). *The Prophecy of Dante*, cantos iii-v of *Don Juan*, and *Marino Faliero* were also pub. in 1821. In 1822 appeared the *Vision of Judgment*. In the following year appeared *Heaven and Earth, a Mystery*, and the same year was pub. *The Island, or Christian and his Comrades* (a poem suggested by the mutiny of the *Bounty*), *Age of Bronze*, and *Werner*. In 1823, hearing that he was elected a member of the Gk Committee, he hastened to the help of Greece and of Grecian independence with money, advice, and finally his presence. Arriving at Missolonghi in Jan. 1824, he was accorded the welcome of a king, and took an active part in the councils of the Greeks. He does not seem to have realised that his health was breaking down, but by the beginning of April it was obvious to all that his days were numbered, and on the 19th of that month he d., in his thirty-sixth year. His poetry has been described as the poetry of glory and passion. His love of liberty characterised his poems also, and certainly in the desire to see the fettered nations of Europe free he was in the forefront of his times. Works, ed. by G. E. Prothero (Letters and Jours.) and E. H. Coleridge (Poetry), 13 vols., 1898-1904; W. M. Rossetti and T. Secombe, 1911. See also L. Hunt, *Lord Byron and some of his Contemporaries*, 1828; T. Moore, *The Life, Letters, and Journals of Lord Byron*, 1830; E. J. Trelawney, *Recollections of the Last Days of Shelley and Byron*, 1858; J. Nichol, *Byron*, 1880; A. Brecknock, *The Pilgrim Poet*, 1911; E. O. Mayne, *Byron* (2 vols.), 1912; H. Nicolson, *Byron: the Last Journey*, 1823-24, 1924; A. Maurois, *Byron*, 1930; I. C. Clarke, *Shelley and Byron*, 1934; P. Quennell, *Byron, the Years of Fame*, 1935, and *Byron in Italy*, 1941; C. E. Vulliamy, *Byron*, 1948.

Byron, Henry James (1834-84), dramatist, b. Manchester. He entered the Middle Temple in 1858. He was the first editor of *Fun*, and for many years was a popular writer of burlesques and comedies. He leased sev. theatres, and appeared on the stage of them himself sometimes. For instance, in 1869 he appeared in his own drama entitled *Not such a Fool as he Looks*. His best-known work is *Our Boys*, which appeared in 1875. His other works include *An American Lady*, 1874, *Old Sailors*, 1876, *A Fool and his Money*, 1880, *Cyril's Success*, 1888, his best piece from a dramatic point of view, *War to the Death*, 1866, and *£100,000 Sterling*, 1867. See *W. Archer, Dramatists of To-day*, 1882.

Byron, John (1723-86), Eng. vice-admiral, grandfather of the poet. As a midshipman he was shipwrecked on the W. coast of Patagonia, and was a prisoner for 3 years, returning to England in 1745. Having distinguished himself in the wars against France, he was put in command of an expedition of discovery to the S. seas. In the course of this voyage he explored the coasts of Patagonia, the Falkland Is., and the Strait of Magellan, discovered sev. new lands, and sailed round the world. B.'s Isle, named after him, he discovered in the track from King George's Is. to Tinian. He was made a vice-admiral in 1776. Commanded the Brit. squadron in the W. Indies during the Amer. war. His *Voyage round the World in the Years 1788-89*, 1789, was trans. into French in 1789 and ed. by Hawkesworth (q.v.) in his *Voyages*, 1773. Dr Johnson's successor on the *Gentleman's Magazine* in 1773.

Byron, Robert (1905-41), Brit. traveller, was educ. at Eton and Oxford. He had a passion for Greece and Gk art, and wrote a number of travel books, including *Europe in the Looking Glass*, 1927, which tells of a journey in Germany, Italy, and Greece; *The Station*, 1928, describing Mt Athos; *First Russia, then Tibet*, 1933; and *The Road to Oxianna*, 1937, record of a visit to Persia, India, and Afghanistan. *The Byzantine Achievement*, 1929, and *The Birth of Western Painting*, 1930, deal with Byzantine art. B. was on his way to Egypt as a special correspondent in the Second World War when his ship was torpedoed.

Byrsnima, genus of evergreen, W. Indian shrubs, family Malpighiaceae. The bark of all the species yields a brilliant red dye, and is used for tanning. Its fruit is edible.

Bysmalith, body of igneous rock which has the shape of a cone underground. Vertical displacement accompanied by faulting characterises this method of intrusion of a molten mass. Mt Holmes, in the Yellowstone Park, U.S.A., is a good example of B.

Byssus, group of silky fibres secreted by the foot of the mussels and molluscs, as a means of attachment to rocks. The B. of some rock creatures can be woven into fabrics. A delicate silk called B. is made from the B. of mussels found in the Mediterranean.

Byström, Johan Niklas (1783-1848),

Swedish sculptor, b. Philipstad. He went to Stockholm, studied for 3 years under Sergel, and visited Rome, 1810. His 'Reclining Bacchant' (half-size), sent home from there, won him recognition as one of the foremost Swedish sculptors. In 1816, on returning home, he brought with him a portrait statue of Bernadotte as Mars. He was prof. of sculpture at the academy, Stockholm. His best works are his female figures: 'Hebe', 'Pandora', 'Juno suckling Hercules', 'Girl entering the Bath'. His huge statues of Swedish kings (Gustavus Adolphus, Charles X, XI, XII) won great admiration. B. also did the altar decorations in Linköping Cathedral, and 'Linnaeus' at Uppsala.

Bytom (Ger. Beuthen), tn of Poland, in Silesia, on the Upper Silesian plateau, 8 m. NW. of Katowice (q.v.). It remained German after the plebiscite of 1921 (see SILESIA), but was incorporated with Poland in 1945, after the Second World War. It is an important mining dist. (coal, lead, zinc), known since medieval times, and has engineering industries. Pop. 121,000.

Bytów (Ger. Bütow), tn of Poland, in Koszalin prov., 50 m. E. of Koszalin (q.v.). Before the Second World War it was in Ger. Pomerania (q.v.). Pop. 2000.

Bytown, former name of the city of Ottawa (q.v.), Canada, under which it was founded in 1829. It became Ottawa on its incorporation in 1834. See BY, JOHN.

Bytownite, rare felspar containing 14 to 18 per cent CaO and intermediate between labradorite and anorthite. Seldom occurs in crystals, but usually found in greenish-white massive, as from the original locality, Bytown (q.v.). A component of basic igneous rocks and sometimes the chief constituent of anorthosite.

Byzantine (coin), see BEZANT.

Byzantine Architecture, see ARCHITECTURE, 4. *Early Christian and Byzantine*.

Byzantine Art. By B. A. is meant the characteristic art of the Byzantine Empire (q.v.). We can assign no absolutely definite date for its commencement, but we can practically take the period which saw the separation of the E. and W. empires as the period of the beginning of this art, i.e. c. AD. 330. It had enormous influence both upon the E. and the W., being itself also influenced by E. and W. Up to the period of the separation of the empires we may regard art as that of the classical period, and B. A. may to a very great extent be regarded as Rom. art under the influence of the E. It reached its highest point in or just after the reign of Justinian, after which it sank slowly into decadence, to rise again for a short time into prominence during the 11th and 12th cents., though it was not extinct when the Turks took Constantinople in 1453. The dominant Byzantine form is architecture (q.v.). This was a development of the Rom. art influenced largely by Persian architecture and by Gk culture, both of which found a common meeting-ground in Constantinople. The 2 chief types are the basilican type and

the circular or central type. Of the latter type the chief examples are SS. Sergius and Bacchus (Constantinople) and San Vitale (Ravenna), whilst the outstanding example of the magnificence of Byzantine architecture is to be found in the church of Holy Wisdom (St Sophia) at Constantinople. Byzantine decoration differs from that of the W., especially from that of Gothic art, since it is always flat and incised and contrasts with the bold, outstanding decoration of the Gothic type. That B. A. had a great influence upon the W. cannot be doubted, since the influence of St Mark's (Venice), which is essentially Byzantine, has been very great; and in painting the Byzantine tradition was powerful in Italy, Greece, the Balkans (spreading to Russia), and Asia Minor. Byzantine MSS. seem to have had their influence on the Irish (e.g. the Book of Kells, q.v.), and even in the 16th cent. El Greco (*see* THEOTOCOPI) was trained in Crete in the Byzantine style of painting. The Byzantine mosaics and paintings have been condemned because of the lack of expression of the faces and the rigidity and fixity of the figures, but this is in keeping with the solemn and ceremonial effect aimed at, and has been revalued in the present cent. by those who recognise other values in art besides realism. Byzantine metalwork and carving also hold a unique place in the hist. of the art of the world. This came under very great influence from the E., and in time came to be regarded almost as a barbaric art. Ivory carving and silk pattern weaving also were developed under Byzantine influence, and reached a great pitch during the period of Byzantine greatness. *See* C. Stewart, *Byzantine Legacy*, 1947, and D. T. Rice, *Byzantine Art*, 1954, and *Beginnings of Christian Art*, 1957.

Byzantine Empire. This empire is often called the Gk Empire, Later Empire, E. Empire, or E. Rom. Empire, and may be said to have come into existence with the founding of the city of Constantinople by the great Constantine. It should be remembered that the B. E. was basically Roman, and carried on many of the fundamental ideas and ideals of the Rom. Empire for a thousand years after the empire in the W. perished. The adoption of Christianity by Constantine, and the founding of the great city of Constantinople, made the B. E. essentially Christian and Roman; it gave the new ideals of the empire a permanent abode, and for cents., even when the B. E. seemed at its weakest and most decayed, it formed the bulwark of Christian resistance to the attacks of paganism. The div. of the Rom. Empire into 2 halves, one based on Constantinople and one on Rome, occurred after the death of Theodosius the Great (395). His son Honorius ruled from Rome, his son Arcadius from Constantinople. Quarrels between the 2 divs. soon arose; and in addition, both suffered from the attacks of barbarians, and often it seemed that both would succumb to the onslaughts of the barbarian races which were threatening them from all sides. The last ruler in the W., the usurper Romulus Augustulus, was

deposed by the Teutonic general Odoacer (476), and from this time onwards the B. E. alone carried on the Rom. traditions, which, as the cents. passed, became increasingly permeated by non-Rom. influences.

It seemed that the B. E. itself might not survive very long. For a time the Ostrogoths threatened Constantinople itself, but the danger passed. The Ostrogoths migrated under their great leader Theodoric to Italy; the fields of Italy were their share of the spoil; the Ger. kingdom was replaced by the rule of Theodoric and his Ostrogoths. Theodoric, although nominally the subject of the emperor, was essentially independent. On his death his kingdom fell swiftly before the attacks of the E. Empire and the Lombards. The emperors at Constantinople were once again able to assert their jurisdiction over Italy, and indeed to rule part of it effectively. The B. E. is seen at its most vigorous under Justinian I (q.v.), who succeeded in 527 and ruled until 565. He had to the full the ideas and ideals of the old Rom. Empire. He tried to restore some of her original boundaries, to make her great in war and peace, in art and commerce, in extent and religion. During his reign the kingdom of the Vandals fell before the vigorous onslaught of Belisarius (q.v.), the resistance of the Ostrogoths was overcome and a large part of Italy restored by the feats of Belisarius and Narses, part of Spain was reconquered, and it seemed that the greatness of the Rom. Empire would be restored. In the field of law Justinian was equally famous, and his Code is in itself enough to perpetuate his name. But during his reign factional fights came to a climax and were waged more fiercely than ever. The great work of the rebuilding of the empire begun by Justinian was soon undone by his successors, and it must be conceded that the weakness of the empire immediately after the death of Justinian was due in part, at least, to the policy of Justinian himself. His schemes were magnificent, his ideals mostly good, but the empire could not bear the expense of continual war and conquest. The period which falls between the death of Justinian (565) and the succession of Heraclius (610) is one of the darkest in the hist. of the empire.

In this interval the Lombards conquered part of Italy, continual war took place with the Avars, war was almost continuous with Persia, and the empire was about to be threatened by a worse foe than the Persians—the Saracens. By the beginning of the 7th cent. the Asiatic provs. were slowly but surely falling into the hands of the Saracens. The strain of gov. broke Heraclius, and then followed a period of almost complete anarchy. The empire was beset with enemies, the Saracens conquered Syria, Egypt, and N. Africa. The power of Islam seemed irresistible, but on 2 occasions, when the danger seemed the greatest, the empire was saved by her cap. Twice Constantinople was besieged by the Muslims, and twice the attacks were beaten off; on both occasions Gk fire helped largely in

the saving of the city. The Heraclian dynasty came to an end in blood and anarchy, and in 717 the Syrian Leo III became emperor (Leo the Isaurian). By this time the B. E. had become essentially Greek in character. The institutions were still Roman, but the prevailing spirit was Greek, and had been so almost from the time of the end of the reign of Justinian.

With the beginning of the Isaurian dynasty a more prosperous era opened. The iconoclastic policy of the emperor, however, has overshadowed his greatness. The army and the finances were reorganised, and the Saracens were repulsed, though the exarchate of Ravenna was lost. But during Leo's reign the controversy on image worship, which for 100 years was to shake the empire and severely weaken it internally, began. The hist. of the Isaurian dynasty is a hist. of constant struggle with Bulgar, Saracen, and Russian, and also of continual religious dispute. Under Constantine VI, the great-grandson of Leo III, the power passed from the emperor to his mother Irene. She caused her son to be blinded and usurped the power. She d. in 803, after she had vainly attempted to negotiate with Charlemagne, who by his restoration of the W. Empire in 800 had finally and irrevocably separated the 2 empires. The war with the Bulgars and with the Saracens continued. Constantinople was again besieged in 815, and Crete and Sicily were conquered by the Saracens. Under Theodora, the widow of Theophilus, the iconoclastic controversy was brought to an end by the Council of Nicaea in 842; image worship was recognised and restored. In 867 Basil I, the Macedonian, founded the Macedonian dynasty, which lasted until almost the end of the 11th cent. The rule of the Macedonian emperors was noted for its vigour and ability, and during this period the Greeks more than held their own with Saracen, Bulgar, and Russian. At the beginning of the 11th cent. (1028) the power of the empire passed into the hands of the Empress Zoe, the wife of Romanus III, who caused her husband to be assassinated, and raised in rapid succession to the imperial throne Michael IV, Michael V, and Constantine IX. In 1055 Theodora, the sister of Zoe, was made empress. Michael VI was chosen by Theodora as her successor shortly before her death in 1056. He was forced to abdicate by Isaac I (Comnenus), who had defeated his army in Phrygia (Aug. 1057), and spent the rest of his life in a monastery. New enemies now began to appear. The It. possessions of the empire were being attacked by the Normans, whilst on her E. frontiers a more formidable enemy than the Saracen had arisen. The Saracens had been driven out in turn by a fierce, warlike tribe from the interior of Asia—the Seljukian Turks. The emperor appealed to Europe for help against the Seljukian Turks; but though after the resulting first crusade conquests unexpected and unwelcome—the first made in Asia Minor—were restored to the emperor, the foundation of the Lat. kingdom of

Jerusalem was a crushing blow to the empire of the E. A Lat. kingdom in the E. meant that the chief routes to that kingdom lay in imperial ter. or over imperial seas, and that it would be necessary now to protect the empire from the W. as well as the E. The hostility thus engendered between the E. and the W. was made much worse by the continual quarrels between the Rom. and the Orthodox churches, which had raged intermittently since 484. By c. 1200 the B. E. again seemed on the verge of collapse. Internal disorders and corruption had seriously weakened it; the Bulgars were strong enough to reassert their independence, and with the beginning of the 13th cent. came the temporary overthrow of the empire. Isaac Angelus and his son, who had been driven from Constantinople, came westward and joined the forces who were preparing for the fourth crusade. They persuaded the leaders, in spite of the opposition of the papacy, to turn aside to Constantinople and to restore them to the throne of the empire. Isaac Angelus was restored, but the newly restored emperor was unable to fulfil his promises to reconcile the Gk and Rom. churches and to aid the crusaders. The partition of the empire was agreed to by the crusaders and a Lat. Empire was set up (1204), an empire founded on purely feudal lines, which probably did more than anything else to disintegrate the E. Empire and to prepare it for its ultimate fate at the hands of the Turks. But within 10 years of its inception the Lat. Empire had begun to decline, and in 1261 Constantinople was captured by the Gk emperor, Michael Palaeologus, and the B. E. revived. But it was surrounded by enemies on all sides. The next cent. and a half marked the increase in power of the Turk and the Serb. The Serbs, after crushing the Bulgars, were themselves finally crushed towards the end of the 14th cent. by the Turks. The Turks gradually won possession after possession of the E. Empire in Asia Minor, and then, about 1360, crossed over to the mainland of Europe, and gradually conquered the whole of the Balkan Peninsula and threatened Hungary. At the beginning of the 15th cent. the Mongol defeat of the Turks checked their career, but by 1420 they had recovered, and Constantinople was again attacked. In 1443 the Christians, who had rallied to the help of the empire, won a victory which, however, was fully avenged in 1444 at Varna. In April 1453 began the final siege of Constantinople, and in May the walls were breached and the city taken, the Emperor Constantine XI falling in the final assault. The city was captured on 29 May 1453. This was the end of the B. E. By 1460 the whole of the Balkan Peninsula was in the hands of the Turks—the sequel to the Norman expansion eastward and the Turkish westward.

See J. B. Bury, *History of the Later Roman Empire from the Death of Theodosius I to the Death of Justinian*, AD 345 to AD 565 (2 vols.), 1889; N. H. Baynes, *The Byzantine Empire*, 1925; S.

Runciman, *Byzantine Civilization*, 1933, *A History of the Crusades*, 1951-4, and *The Eastern Schism*, 1955; G. Ostrogorsky, *History of the Byzantine State*, 1956.

Byzantine Literature. Gk literature written between the dedication of Constantinople (AD 330) and its capture by the Turks (1453). The theological disputes which marked the first half of this period, together with liturgical developments and the flourishing condition of monastic life in the oriental church, produced a vast body of religious literature. Outstanding among writers in this field were SS. Athanasius, Basil, Gregory of Nazianzus, Gregory of Nyssa, John Chrysostom, and Cyril of Alexandria. All these belong to the 4th and first half of the 5th cent.; their writings consist for the most part of dogmatic treatises, homilies, letters, as well as exegetical and ascetical works. The mystical treatises of pseudo-Denys (late 5th cent.) exercised a lasting influence upon the spirituality of both E. and W. Monophysitism in the 6th cent. was attacked by Leontius of Byzantium, who was the first to introduce Aristotelian definitions into theology, and by Anastasius of Antioch. Anastasius of Sinai was among the leading enemies of Monothelitism in the 7th cent. St John Damascene (c. 675-749) wrote a number of speeches against the Iconoclasts, but is more famous for his *Fountain of Knowledge*, the first comprehensive exposition of Christian dogma. Symeon the New Theologian (994-1022) was the author of sev. works dealing with monastic reform and the ascetical life. His pupil and biographer, Nicetas Stethatus (11th cent.), also wrote on asceticism and the religious life, as well as taking an important part against the Lat. Church at the time of the schism, while Theophylact of Bulgaria (d. 1118), besides his poems and theological commentaries, left a series of letters which are a valuable source for Bulgarian hist. The prin. hagiographical productions of the Byzantine period are Symeon Metaphrastes' *Acts of the Martyrs* and the celebrated list of *Ruthnam and Josephat*. Religious poetry, after an early period of experiment, reached its greatest heights with Romanus (6th cent.), Andreas of Crete (c. 650-725), St John Damascene, and Cosmas of Jerusalem. But the greatest and most sustained achievement of B. L. is that of historiography. Zosimus, Procopius, and Agathias cover the 6th cent. From the 7th to the 10th cent. we have to rely mainly upon Joseph Genesius and the unliterary but valuable chronicle of Theophanes. This was a continuation of a world chronicle written by George Syncellus, and extends from 284 to 813; it was itself continued by sev. anonymous hands and brought down to 961. Leo the Deacon's *History* (959-75) was continued by Michael Psellus and Michael Attaliates down to 1079, while the period of the Crusades is dealt with by Nicephorus Bryennius, Anna Comnena, John Cinnamus, and Nicetas Choniates as far as 1206. The chronicles of Constantine Manasses, John Zonaras, and Michael

Glycas cover much of world hist. to 1118. Sev. outstanding historians deal with events between 1203 and 1477. These include George Acrophites, George Pachymeres, Nicephorus Gregoras, John VI Cantacuzenus, Laonicus Chalcocondylas, Ducas, and George Phrantzes. Also worthy of note are some treatises on imperial administration and court ceremonial, e.g. the *De Magistratibus* of John the Lydian (6th cent.) and the *De Ceremoniis* of Constantine VII Porphyrogenitus (10th cent.), under whose supervision were also produced the *De Ceremoniis* and *De Administrando Imperio*. The efforts of Michael Psellus in the 11th cent. revived interest in Plato and Aristotle. Rhetoric, however, was more popular. The most intelligent exponents of which were Nicephorus Phocas and Michael Choniates. The outstanding monuments of Byzantine philology are the *Library* of Photius and the lexicon known as *Suidas*. Profane poetry was an arid field: the *Dionysiaca* of Nonnus (5th cent.) and the *Expedition*, etc., of George Pisides (7th cent.) are examples of Byzantine epic. Throughout the whole period in question subjective poetry took the form of epigram, which ranged from mere trifles to narrative or elegiac poems of considerable length, and attained its full flower in the 10th and 11th cents. with Johannes Geometres, Christophorus of Mytilene, and John Mauropus. See also separate articles. See J. A. Wright, *A History of Later Greek Literature*, 1932, and N. H. Baynes and H. St L. B. Moss, *Byzantium*, 1948.

Byzantium, anc. Gk city on the shores of the Bosphorus, occupying the most easterly of the seven hills of modern Istanbul (Constantinople). It was founded by a body of Megarians about the year 657 BC, and quickly, owing to its position, became a settlement of considerable importance. The settlement was destroyed by the satrap Otanes in the reign of Darius Hystaspes, but was recolonised by Pausanias the Spartan, who took it from the Medes after the battle of Plataea (479 BC). A few years after this second settlement, Cimon (son of Miltiades) seized it from the Spartans, but in 440 BC the city revolted and returned to its former allegiance under the Athenians. When Pausanias founded the second settlement there flocked to the city a mixed pop. of Athenians and Spartans—whence the subsequent conflicts. During the Peloponnesian war (431-404 BC) the city was a constant source of contention between the Athenians and the Spartans, falling into the hands of each party in turn, and continuing to change hands even after that war and until it achieved its independence of both, only to fall into the hands of the Macedonians. Before this, however, it passed through many vicissitudes. Clearchus (q.v.), a Spartan general of the 5th cent. BC, became harsher of B., but in his absence the city was surrendered to the Athenians. Subsequently Clearchus was sent into Thrace to protect the Gk colonies, but was recalled by the ephors. He refused to obey and made himself master

of B., ruling as a despot and thereby alienated the sympathies of the Athenians. Alcibiades, after a close blockade, won the city through the treachery of the Athenian party, and thereafter B. remained the ally of Athens until it was recaptured by Lysander (405 BC). Under the Spartans it was in danger of pillage by the Ten Thousand (*see* TEN THOUSAND, EXPEDITION OF THE), who were, however, repressed by Xenophon. In 390 BC Thrasybulus, the Athenian, succeeded in wresting the city from the Spartan oligarchy and in restoring democracy and the Athenian influence there. After resisting an attempt by Epaminondas to restore it to the Spartans, the city co-operated with Rhodes, Chios, and other Aegean is. states in securing their independence of Athenian suzerainty; but, on the advance of Philip of Macedon against B., the city quickly sought the help of Athens. By Phocion, the Athenian statesman and general, Philip was forced to raise the siege. The deliverance of the city through the 'miraculous' flash of light, which

revealed the advancing Macedonian host, so appealed to the imagination of the Byzantines that they erected an altar to torch-bearing Hecate and impressed a crescent on their coinage as a symbol of the portent. B. struggled against and repelled threatened invasions of the Gauls, and for some time enjoyed a certain amount of independence. It became an allied city of Rome, but was later reduced to the position of an ordinary Rom. colony. Severus attacked and captured it, levelling it to the ground, and afterwards rebuilding a considerable portion of it. Constantine, seeing the advantages of the natural position of the city, made it his new cap., and built a magnificent city there. The new cap. of the Rom. Empire was inaugurated in AD 330. The emblem of the crescent was adopted by the inhab. of B., and was afterwards adopted by the Turks during their possession of the city. The tn received the name of Constantinople when it was rebuilt and occupied by Constantine. *See* ISTANBUL.

C: 1. Third letter of the Rom. alphabet; it had originally (in the Semitic, Gk, and Etruscan alphabets) the shape of 1 (Semitic), 1 or 1 (Greek), and > or < (Etruscan), becoming rounded in the Etruscan and Rom. alphabets, 3 or C. Its sound was originally (in the Semitic and Gk alphabets) that of *g*. The Etruscans, knowing no distinction between *k* and *g*, employed the letter C both for *g* and *k*. When the Romans adopted this letter they continued to employ it for *g* and *k* (hence the abbreviations C for Galus and CN for Gnaeus), but in 312 BC they created a new letter for the sound *g*, retaining the letter C for the sound *k*. Consequently, when the letter C was introduced into Britain, it was used only to represent the hard sound of *k* (cf. O.E. *cyn*, *brēcan*, *rōc*, with Mod. E. *kin*, *break*, *rock*). In Italian, French, and English, C retained the sound *k* when followed by *a*, *o*, *u*, or a consonant other than *h* (cf. O.E. *catt*, *corn*, *cuman* (come), *clēdw*, with their modern equivalents); but before *e*, *i*, *y*, it tended to become palatalised to a sound resembling *sh*, *ch*, and finally *ch* (cf. Lat. *castra*, a camp, with O.E. *ceastre*, Mod. E. *Chester*). When, in English, C retained the *k*-sound before *e*, *i*, and *y*, it was written *k* to avoid confusion. The palatalised C before *e* and *y* was written *ch*, as in French. Thus, O.E. *rice*, *cild*, has developed into Mod. E. *rich*, *child*. O.E. *cw* was abandoned, and the French *qu* or *qu* adopted (cf. O.E. *cwēn*, M.E. *quene*, and Mod. E. *queen*; O.E. *cweðan*, Mod. E. *quoth*). See ALPHABET.

2. In music, is the tonic of the scales of C. That of C major is sometimes called the natural scale, because it has neither sharps nor flats. The scale of C minor has 3 flats, B, E, and A. C is also used as a symbolic time-signature to represent common time, i.e. 4 crotchets in a bar, but this is actually a broken circle rather than the letter C, a survival from old notation.

Ca ira (*It will go on*), popular song of the Fr. Revolution, so named from its refrain:

Ah! ca ira, ca ira, ca ira!
Les aristocrates à la lanterne.

The words, traditionally by Ladré, a street singer, were put to an older air, *Le Carillon national*. The song was prohibited by the Directory in 1797.

Caaba, see KAABA.

Caaling Whale, see CA'ING.

Cab, originally a form of horsed vehicle, with 2 or 4 wheels, for carrying passengers. At the beginning of the 19th cent. the *cabriolet de place*, invented about 1660 by Nicholas Sauvage, was introduced into London from Paris. The first 8 licensed cabs—this shortening was adopted as early as 1825—appeared on London streets in 1823. Besides the

driver they could carry 2 passengers inside and were run for fares which were one-third less than those of the hackney coach. A contemporary newspaper refers to the fact that 'cabriolets were in honour of his majesty's birthday introduced to the public this morning' (23 April 1832). These C.s stood for hire in Portland St., were painted yellow, and were limited in number to 12. But the limit to their number was soon removed in spite of vested interests, as their popularity increased so fast. The cabriolet, which had superseded the old hackney coach (Pepys's 'hacquenée'), was in its turn supplanted by a new kind of C. invented by



HANSOM CAB

E.N.A.

M. Boulnois. In this vehicle the occupants faced one another and the driver sat on top. Finally in 1836 a larger C, a cheaper imitation of the brougham, came into use. The Clarence four-wheeler was only an improvement of this design. As a rival to the 'growler' the 'hansom' (invented by Joseph Hansom) was patented in 1834. This consisted originally of a square framework on 2 wheels with a 7½-ft diameter. Its good speed, due largely to its lightness, and its spruce appearance and pleasant bounding motion, made it a matter of regret to many when this means of street locomotion was superseded in the metropolis by the motor taxi-C. In 1886 there were 3997 4-wheelers and 7020 hansoms in London. The advent of the petrol-driven vehicle discouraged manufacturers from patenting further improvements such as indiarubber tyres, etc. for horse-drawn C.s. Cabmen's shelters, first estab. in 1875, by providing accommodation for drivers on the stands did much to encourage sobriety. The Acts which regulate taxi-C.s in London are the Hackney Carriage Acts, 1831-53; the Metropolitan Public Carriages Act, 1869; the London Cab Act, 1896; and the London Cab and Stage Carriage Act, 1907. These Acts, together

with the London Cab Order, 1934 (as amended), made by the Home Secretary by virtue of certain of the Acts, provide for the licensing of the vehicles and drivers, regulate the construction of the vehicles, the places at which they may stand to ply for hire, the rules governing hirings, and the fares which may be charged. They also protect drivers against fraudulent passengers. Licences, which are only granted to men of approved character who have a good knowledge of London, are issued by an assistant commissioner of police who is authorised to do this by the home secretary. *See also* HACKNEY CARRIAGE and TAXIMETER.

Cabal (Fr. *cabale*; Heb. *kabbalah*, something received with an idea of secrecy). The word 'cabal' with the meaning of 'club' or 'association of intriguers', had been popularly applied to the secret councillors of the king under James I; and the accidental coincidence that, in 1671, the effective power was in the hands of the 5 unprincipled ministers of Charles II, Clifford, Ashley, Buckingham, Arlington, and Lauderdale, the initials of whose names made up the word C., caused the latter designation to be used for some years afterwards as synonymous with cabinet. The word C. is now applied to any intriguing faction that works in secret for private or political ends.

Caballero, Fernan, *see* FABER, CECILIA.

Caballero, Francisco Largo, *see* SPAIN, History.

Cabanatuan, cap. of the prov. of Nueva Ecija, Luzon, Philippine Is., and one of its chief commercial centres. Pop. 54,668.

Cabanel, Alexandre (1823-89), Fr. painter, b. Montpellier and studied under Picot. Attention was first called to him by his 'Death of Moses,' 1852, and he made a reputation as an accomplished academic painter, and even more as a teacher. His 'Birth of Venus' acquired by the Luxembourg was a charming nude study.

Cabanis, Pierre Jean Georges (1757-1808), Fr. physician and writer, b. Cosnac, Corrèze. During the revolution he acted as physician and friend to Mirabeau; in 1797 he was made clinical prof. in the medical school at Paris; he was elected to the Five Hundred, and, under Napoleon, became a member of the Senate. C. wrote extensively on medicine and on metaphysics. *See* Dubois, *Examen des doctrines de Cabanis*, 1842, and Labrousse, *Quelques notes sur Cabanis*, 1903.

Cabaret, Fr. word which in its original signification meant simply a booth or wooden shelter. Its use to-day is restricted to that of a small tavern or wine-shop. In a more popular sense it denotes the entertainment—singing and dancing—in hotels and restaurants after theatre hours.

Cabatuan, municipality in the Philippine Is., 13 m. NW. of Iloilo. It grows rice. Pop. 24,743.

Cabbage (*Brassica oleracea*). The wild C. is a biennial or perennial herb, indigenous as a coastal rock plant in S. and SW. England and Wales and on the

Atlantic coasts of Europe. The cultivated races are many and may be classified as follows: (1) All the leaf-buds active and open, as in the wild C. and kale. (2) All the leaf-buds active, but forming heads, as in Brussels sprouts. (3) Only the terminal leaf-bud active, forming a head, as in common C. (4) The terminal leaf-bud alone active and open, with flowers abortive and succulent, as in cauliflower and broccoli. (5) All leaf-buds active and open, with the flowers abortive and succulent, as in sprouting broccoli. A very interesting variety of C. is grown in the Channel Is., known as



Left: Wild cabbage. Right, upper: Garden cabbage. Right, lower: Savoy.

the Jersey C. Its usual height is about 8 ft., but it has been known to reach a height of 16 ft. The central stem is so woody that it is used for the making of walking-sticks. Some varieties are even cultivated as ornamental plants on account of the beauty of their leaves in form and colour. Brussels sprouts resemble miniature C.s. Nothing seems to be known as to the origin of the plant, but according to Van Mons (1765-1842) it was heard of in 1213 by the name of *spruyten*. It is most hardy. The Savoy is a hardy green variety, with the characteristic of producing very crinkled leaves. The cauliflower is said to have been brought from Cyprus, where it appears to have been cultivated for ages. It grows well in a rich soil, with a sheltered position, and is a vegetable with a most delicate flavour. Broccoli is a variety of cauliflower. The earliest sowing of C. should be made early in Mar., to be ready for use in July and Aug., and another sowing should take place at the end of Mar. to ensure a supply from Aug. to Nov. The most important of all is the autumn sowing, which should be made the last week in Aug. Kohl-rabi cabbage (*B. oleracea caulorapa*), with a turnip-shaped stem, is used in England as food for cattle. The C. is a biennial, and to obtain seed for

future use plants should be left until the second year. See BRASSICA.

Cabbage-bark Tree (*Andira inermis*), evergreen tree of the family Leguminosae, indigenous to the W. Indies. It has leaves about 12 in. long, with purple flowers. Its bark is useful as an antidote to intestinal worms.

Cabbage Butterfly is a name common to sev. species, the larvae (caterpillars) of which feed on the leaves of cruciferous plants, especially of cabbages. The large white (*Pieris brassicae*) is a very common species in Great Britain. The expanded wings measure 3 in. across, and are white with black edgings. The female, which is the prettier, having black spots on the upper surfaces of the wings, lays her yellow eggs in clusters on the leaves of caterpillar food. The fully grown caterpillar sometimes measures 1½ in., and will eat twice its own weight of leaf in 24 hours. After it has hung for some time by its tail from a ledge, it is changed into a shining pale green chrysalis. The butterfly, which, in the case of the autumn brood, waits till winter is past before coming out, lives daintily on nectar. The small white, or turnip butterfly (*P. rapae*), has a wing expansion of about 2 in., lays its eggs singly on the under side of vegetable leaves, and produces a velvety caterpillar which devours the hearts, instead of merely the leaves, of cabbages. It is often, therefore, a still more dangerous pest than the large white. The chrysalis is brownish-yellow with black spots. The third species, the green-veined white butterfly (*P. napi*), which is similar to the small white, cannot multiply so fast, because both the butterfly and its caterpillar are a favourite food of small birds. A watch should be kept for eggs of cabbage whites, and when found they must be destroyed. Cabbages should be dusted with Derris or other insecticide, prevention of an attack being easier than a cure. Ichneumonflies parasitise the caterpillars and help to control them.

Cabbage Palm, or Cabbage Tree. There are many different species, the prin. being the *Roystonea oleracea*. It is a native of the W. Indies, and may grow to 100 ft, but it is often cut down when young for the edible, tender central leaves and bud, resembling a cabbage.

Cabbage Wood. See PARTRIDGE WOOD.
Cabbala (Heb. *kabbalah*, something received, hence tradition), the designation of a mystic system of philosophy, theology, and magic, once prevalent among the Jews. Its popularity began in the 12th cent. and continued till the 16th. It has now few adherents—those for the most part in E. Europe. The Cabbalists taught a pantheistic doctrine that there was one Being and that nothing existed but this one Being and its manifestations. God, therefore, was an Absolute Being, and from Him emanated 10 attributes—wisdom, understanding, mercy, and the like—that as this Being became conscious of its existence, it poured itself through 'channels' into the world of pure spirits and angels, and into the lower world,

which thereupon came into existence; that the soul of man passed from body to body, till it finally returned to and became absorbed in God. Their teaching was obviously influenced by the idealistic philosophy of Plato, combined with the degenerate philosophies of the Neoplatonists. The Cabbalists attached much significance to numbers. The fact that every letter in Hebrew stands for a number enabled them to read into the Scriptures many strange doctrines. Every passage was regarded as symbolic. It was claimed that their doctrine had been revealed, according to some, to Abraham, and, according to others, to Adam; the tradition was passed on by word of mouth until it was felt necessary to put the mystic lore into written form. The authoritative documents of C. are (1) the *Sefer Jezirah*, 'Book of Creation,' supposed to have been written by Rabbi Akiba (d. AD 135); (2) the *Sefer Hazzohar*, 'Book of Light,' commonly called Zohar. It is written in a form of Aramaic which shows it to have been composed in the 12th or 13th cent., and some have suggested that the author might have been Moses de Leon of Spain. Other Cabbalistic writers were R. Moses ben Nachman, better known as Ramban (1195–1270), and Pico della Mirandola (*Conclusiones Cabbalisticæ*, 1517). See S. A. Hirsch, *The Cabbalists*, 1922; G. Scholen, *Bibliographica Cabbalistica*, 1927; and articles in the *Jewish Encyclopedia*.

Cabell, James Branch (1879–), Amer. novelist and genealogist, b. Richmond, Virginia. While still a student he was instructor in French and Greek at William and Mary College, 1896–7, graduating in 1898. He worked for a time as a journalist, and in 1913 was appointed genealogist of the Virginia chapter of the Sons of the Revolution. He first came into prominence as an author with his novel *Jurgen*, 1919, which was attacked for immorality and temporarily suspended. The background of sev. of his stories is the fanciful country of Poictesme, and a series styled the 'Biography of Manuel' purports to trace the lineage of its nobility from Dom Manuel, Count of Poictesme, to his Virginian descendants. C. has been criticised for 'the opulent monotony of his decorative manner.' Among his works are *Gallantry*, 1907, *Chivalry*, 1909, *The Rinet in Grandfather's Neck*, 1915, *The Silver Stallion*, 1926, *Something About Eve*, 1927, *Townsend of Lichfield*, 1930, *These Restless Heads*, 1932, *Preface to the Past*, 1936, *The King was in his Counting House*, 1938, *The First Gentleman of America*, 1942, *Let me Lie*, 1947, and *Quiet, Please*, 1952. See C. van Doren, *James Branch Cabell*, 1925, and a bibliography by G. Holt, 1924.

Caber. Tossing the, is especially a Scottish sport—a conspicuous event in throwing a slim tree-trunk, often 20 ft long, in such a way that, after turning over in the air, it will fall in a straight line with the 'tower,' the smaller end being furthest from the thrower. The C., the

diameter of whose thin end should not be more than 3 in., must be hurled as far as possible from the thrower.

Capes, or **Gabes**, oasis of date palms in Tunisia with 22,152 inhab., including 1548 Europeans. It exports dates.

Cabet, Etienne (1788-1856), Fr. politician and a leader of the Carbonari, was the son of a cooper of Dijon. He studied law, and under Louis-Philippe became procureur-général of Corsica. Bitter attacks on the gov., made in the Chamber of Deputies of which he was a member, led to his exile in England (1834). On his return to France in 1839, after the declaration of a general amnesty, he pub. a very prejudiced hist. of the Fr. Revolution in 4 vols. (1840), and later, his *Voyage en Icarie*, a romance in which he expressed his communistic views. Determined to put some of them into practice, he sent out in 1848, with the approval of Robert Owen, a colony of 1500 'Icarians' to a tract of land in Texas. But the community of property, which was to have been the special feature of the settlement, proved an utter failure. In 1849 C. himself sailed to America and transferred the settlers to Nauvoo in Illinois. For a time he ruled his little band like an autocrat, but the colonists finally banished him in 1856, and he d. at St Louis.

Cabezón, Antonio de (1510-66), Sp. organist and composer. He was blind from early childhood, but became very famous, being appointed to the service of the Empress Isabel, and after her death in 1539 to that of Prince Philip, with whom he went to Italy, Germany, the Netherlands, and England. He wrote especially for the organ, the clavichord, and the vihuela, a Sp. type of lute.

Cabildo, or **Ayuntamiento**, corporation of old Spain which has been likened by some writers erroneously to the municipal councils of England, but which in no way resembled them. They may have had their real origin in Rom. times, but in their medieval form C.s probably owed their creation in the 11th and 12th cents. to the desire of the Sp. monarchs to curb the power of the nobles. The 'illustrious Cabildo' existed throughout the Sp. Empire, and under Sp. rule Trinidad too had its C., which played a prominent part in its hist. The term *cabildo* signifies a 'congress of assembly,' composed of the chief magistrates, aldermen, and others, charged with the administration and internal gov. of a tn. The Sp. kings confided to the C.s, or councils of the people, civil and criminal jurisdiction, as well as all matters of municipal gov., but reserved to themselves the right of hearing appeals and complaints from persons dissatisfied with the decision of these tribunals. The *alcaldes* or magistrates for the year, as also the other officers of civil and criminal justice, and all the functionaries charged with the internal administration of the tn., were also elected from, or appointed by, the C. C.s existed in all the Sp. colonies, but of course had to undergo certain modifications, rendered necessary by circumstances. S. America,

for instance, was governed by viceroys having under them provs. ruled by captains-general, whilst colonies like Trinidad were placed under governors, supreme in military matters, but who, for purposes of civil gov., were only corregidores of their C.s.

Cabillonum, see CHALON-SUR-SAONE.

Cabin (It. *capanna*, Sp. *cabaña*); 1. Small room in a ship used as a sleeping apartment. A swinging hammock or cot is sometimes called a hanging C.

2. Rude shelter or hut, small house or cottage. Also a temporary shelter for stores.

Cabinet, term recognised by the conventions of the Brit. Constitution, but not by the law, applied to the body of men who are chosen from the political party in power to fill the highest executive offices in the state, and who, by their apparently or really unanimous policy, direct the gov., and are collectively responsible to Parliament for every act of the Crown.

History of the Cabinet. There were indications of an inner council of state before the Tudor period, but they are of an indefinite nature. Even before the Conquest there always existed a body of advisers of the Crown distinct from the General Assembly. After the Conquest that body was known as the Continual Council or Concilium Ordinarium, and was in effect a permanent committee of the National or Common Council which became merged in the larger assembly whenever it was convened. Nominally this committee was the instrument of the royal prerogative. Under the weaker monarchs it was virtually independent. Then the Common Council gradually evolved itself into the national Parliament, and the Concilium Ordinarium became a strictly official body distinct from it and wielding enormous executive powers, its members being bound by a special oath of fidelity and secrecy. During the reign of Henry VI a nucleus formed within the Concilium Ordinarium called the Concilium Privatum, or Privy Council (q.v.), constituting the king's constitutional body of advisers, while the Concilium Ordinarium, no longer consulted on executive matters, lapsed into a body of legal advisers or figures in the Star Chamber. The Privy Council continued to be the king's advisers down to the reign of Charles II. That monarch found its numbers too large and the restraints it imposed on his actions irksome. He therefore resorted to the practice of confiding in a 'cabal' or clique of confidants. Sir Wm Temple eventually persuaded him to agree to the alternative plan of forming a select committee of the Privy Council, called the C. Council. This distinction between the C. and the Privy Council has existed ever since that time, although the C. Council, or C., in its present form dates rather from the revolution of 1688 or shortly after. The Privy Council has at the present day no executive or deliberative functions. The C.s of William III and Anne were chosen from both Whigs and Tories for the most part. William

III was strongly opposed to gov. by party, but from force of circumstances began after 1693 to entrust the chief administrative offices to the Whigs. The resulting body was popularly known as the Junto. When the Whigs went out of power the ministry did not feel compelled to resign. Queen Anne was especially averse from party gov., and it was only after the accession of George I that party gov., or parl. gov. by means of a ministry composed nominally of king's servants, but actually of an executive committee representing the will of the majority in the House of Commons, became finally and firmly estab., a result due rather to the fortuitous circumstance that both that monarch and George II acquiesced in the domination of their ministers, and absented themselves from the deliberations of the C., partly because they could not understand English and Eng. affairs, and partly because they preferred to devote their energies to Hanover. Finally, on the advent of Pitt's ministry of 1783, the idea of a C. consisting of men willing to serve under a Prime Minister, and to adhere to a definite programme, became an estab. necessity.

Characteristics and nature of the modern Cabinet. The C. of the day is thus a group of ministers of the Crown who are also leading members of the 2 Houses of Parliament, and whose opinions on the most important questions of the time agree in the main with the opinions of the majority of the House of Commons.

The result of the estab. of our system of gov. upon a representative basis is that the C. is collectively responsible to Parliament for the policy it pursues, and, in theory, the members of the C. are obliged to stand or fall together, and to act as one man on all questions relating to the executive gov., so that if one of them dissents from the rest on a question too important to admit of compromise, it is his duty to resign. When the policy of the C. no longer commands the approval of the majority of the House of Commons, the ministers are in duty bound to resign *en bloc*. Differences of opinion when publicly manifested would lead to the break up of a C., because by the conventions of the constitution all the members of the C. are jointly and severally responsible for all its measures.

The C. is not exactly synonymous with the ministry of the day. The growth in the number of depts in modern times has made it impossible to include all ministers in the C. itself. But ministers who are not members of the C. receive C. minutes and are entitled to submit papers to the C., and those in charge of depts attend C. meetings at which matters affecting their dept are discussed. They thus partake of the C.'s collective responsibility.

The C. now invariably includes the first lord of the treasury, the lord president of the council, the lord privy seal, the chancellor of the exchequer, the lord chancellor, and the secretaries of state for foreign affairs, the home dept, commonwealth relations and the colonies. In recent years the secretary of state for

Scotland, the president of the board of trade, the ministers of defence, agriculture, housing, and local gov., education, and labour have been members. A novel feature was the inclusion in 1912 of the attorney-general, Sir Rufus Isaacs. Nearly all the members of the C. are chiefs of depts. Frequently one or two experienced ministers are included for the sake of their advice, and to those are assigned such offices as lord privy seal or chancellor of the duchy of Lancaster.

The C. is presided over by a chief who is conventionally known as the Prime Minister or Premier, but is unknown to the law except in his capacity of first lord of the treasury, or as holder of some other executive office, and as a member of the Privy Council, which later body by a legal fiction is the constitutional advisory council of the sovereign. The Premier now has, however, a definite precedence allotted to him. The ministry is called into existence by the sovereign, who generally takes the advice of the outgoing Premier as to who shall be sent for and asked to form the new ministry. In practice the sovereign's choice is really limited to some 2 or 3 names at the most, for political usage has estab. the claim of the leader of the dominating party or coalition of parties to be sent for by the monarch. According to Bagehot, if any one else were sent for it would be his duty to press the claims of the true leader, and he cites the case of Lord Granville being invited in the first place to form a new ministry instead of Mr Gladstone. The new premier then chooses his fellow ministers, but, till recently, custom did not permit him to exclude ex-ministers belonging to his party.

The relations of the sovereign and the C. are such that the sovereign is constitutionally obliged to take the C.'s advice and lend it his moral and social support. The C. is bound, as is each individual member, to inform the sovereign on all important measures of the executive, but the Premier has the exclusive right to approach the sovereign personally on all important matters of state. Other ministers, however, have a right to discuss with the sovereign matters merely departmental. The result of the evolution of the powers of the C. Council is that that body is *de facto* the gov. of Great Britain. Whatever in legal theory the Brit. polity may be, this in reality is the form of the active governing machinery of the Brit. constitution.

The phrase 'ministerial responsibility,' which is intimately bound up in treaties on the constitution with the nature and functions of the C., and which, in its strict sense, denotes the legal responsibility of every minister for every act of the Crown in which he takes part, is a convention resulting from the theory that 'the king can do no wrong,' and from the refusal of the courts to recognise any act as done by the Crown which is not done in a particular form—a form in general involving the affixing of a particular seal or the counter-signature of a minister (Dicey). Ministerial responsibility in the

sense that ministers are liable to lose office if they are unable to retain the confidence of the House of Commons is a theory depending on the conventions of the constitution, with which the law has no direct concern.

While the foregoing is the generally accepted view of the position and functions of the C., it is to be observed that Bagehot, in *The English Constitution*, acutely defines the C. as a combining committee—a hyphen which fastens the legislative part to the executive part of the State; that while in its origin it belongs to the one, in its functions it belongs to the other; and that though it is a committee of the legislative assembly, it is a committee which can actually dissolve the Parliament which appointed it, and appeal if it chooses to the next Parliament. His theory is a refutation of the dogma that in our polity the legislative and executive powers are entrusted to separate sets of persons, each independent of the other, and asserts that the peculiar excellence of the Eng. Constitution is the practical fusion of the executive and legislative powers through the C. In comparing the C. with the presidential system of the U.S.A., in which latter system the legislative and executive powers are independent of each other, Bagehot comes to the conclusion that the C. system is superior in that it facilitates administration, obviates the disadvantage of making the people the real executive-choosing body, eliminates corruption, and gets rid of the antagonism between the legislature and the executive which, springing from the fact that the House of Representatives is elected by one process and the president by another, ends in the impairment of each. The delicate relations of the C. to the Crown on the one hand and to the Houses of Parliament and the people on the other, as well as the internal relations of its members to each other and to the Premier, are clearly expressed by Gladstone in *Gleanings of Past Years* thus: 'The association of the Ministers with the Parliament and through the House of Commons with the people is the counterpart of their association with the Crown and the prerogative. The decisions they take are taken under the competing pressure of a bias this way and a bias that way, and strictly represent what is termed in mechanics the composition of forces.' Such a description could not be applied to a presidential system like that of the U.S.A., where the president is elected for a fixed term. Dicey, however, justly doubts whether the Eng. Constitution may not be undergoing an insensible change due to the increasing authority of the electorate. He believes a general election may in effect be a popular election of a particular statesman to the premiership, and that the time may come when, though all the forms of the constitution remain unchanged, an Eng. Prime Minister will be as truly elected to office by a popular vote as is the Amer. president.

In substance the C. is the directing body of the national policy, or at least

until very recent times it has been generally so regarded. On the other hand it might appear to-day that a party caucus is the real directing power behind the C., a position that might be difficult to sustain. The main functions of the C. were set out in the report of the Machinery of Gov. Committee (C. 9230 of 1918) as: (a) the final determination of the policy to be submitted to Parliament; (b) the supreme control of the national executive in accordance with the policy prescribed by Parliament; and (c) the continuous co-ordination and delimitation of the authorities of the sev. depts of State. Rightly this statement draws no distinction between legislation and administration. In the modern State most legislation indeed is directed towards the creation or modification of administrative powers. The C. is a general controlling body. Many of its members are departmental ministers. It neither desires nor is it able to deal with the multiple details of gov. It expects a minister to take all decisions which are not of real political importance. Certain matters are conventionally regarded as being outside the C.'s competence. Lord Oxford and Asquith said that, speaking generally, the exercise of the prerogative of mercy, the personnel of the C., and the making of appointments, are not discussed in the C. But the question of the reprieve of Sir Roger Casement in 1916 was brought before the C., though normally the prerogative is left to the home secretary. Again, the personnel of the C. has often been discussed by the C. in the past, though usually in exceptional circumstances. Another matter which is seldom discussed in C. is the conferment of honours. Yet another is the exercise of the prerogative of dissolving Parliament. This is, however, a recent development, and if the Prime Minister wants the advice of the C. there is nothing to prevent him from raising the question. In the past some C.s appear to have decided by vote questions on which an agreed solution could not be reached. The decision to arrest Dillon in 1881 was carried by Gladstone's casting vote. The question of the removal of the Duke of Wellington's statue from Hyde Park Corner in 1883 was decided by a show of hands. In any case, the taking of votes is exceptional. It is said that on the Education Bill in 1901 the C. divided sev. times, a practice which, according to Fitzroy (*Memoirs*), large C.s have rendered unavoidable. The C. itself is a committee, and it reaches its conclusions in much the same way as other committees—discusses a subject from various aspects until some compromise emerges.

The C. is a wholly secret body. Its meetings are in theory and in reality secret. Disclosures of C. decisions are made only with the permission of the sovereign. A minister who resigns from the C. usually desires to make an explanation in Parliament, and since this involves an explanation of C. discussions he must get the sovereign's consent. For this purpose he asks permission through the

Prime Minister. But this rule is not always obeyed, and generally speaking it is difficult to prevent revelations of C. discussions when they are matters of political controversy, nor is the press left entirely without guidance through the usual 'understood' formula. As to C. solidarity or collective responsibility, the precedents are inconclusive. 'It may be said, first, that the Prime Minister is frequently in a position to pledge his colleagues' support, because the only alternative is his own resignation. Secondly, a minister should not announce a new policy without C. consent; but if he does the C. must either support him or accept his resignation. Thirdly, a minister ought to be chary about expressing personal opinions about future policy except after consultation; and if the circumstances are such as to pledge the gov., the Prime Minister has a real cause of complaint. Any statement in advance of a C. decision is dangerous to the stability of the gov.' (W. Ivor Jennings, *Cabinet Government*, 1936).

Until 1916 there was no C. office and no secretary, and there were therefore no formal agenda. This unbusinesslike system broke down completely under the stress of war. One of the first acts of Lloyd George on the formation of the War C. in 1916 was to set up a C. secretariat to organise the business of the War C. The taking of notes by any minister other than the Prime Minister was for long forbidden, but since 1916 there have been formal C. minutes. Unless the C. directs otherwise, the secretary to the C. or his deputy is present at every C. meeting. He takes no part in the discussion unless his opinion is asked on a particular point (such as a point of procedure) but merely makes a note of the C.'s decisions. This note is known officially as the C. 'conclusions,' though more popularly as the C. 'minutes.' The C. secretariat is not an advisory body. It does not make recommendations, nor does it interfere with departmental responsibility.

One of the most notable changes produced by the First World War was the creation of the Imperial War C., which first met in 1917, under the presidency of Lloyd George, the Brit. Prime Minister. It consisted of the members of the Brit. War C. sitting with the representatives of the dominions and India who were attending the Imperial Conference of 1917. While the Imperial War C. was in session the overseas members had access to all the information at the disposal of the home gov. and had a status of absolute equality with the members of the War C. of Great Britain. The Imperial War C. sat during the whole period of the Imperial Conference of 1917, and in 1918 it was in session from June to Aug. At the conclusion of this session it was announced that, in view of the success of the experiment, the Prime Ministers of the dominions should, in future, have the right, whenever they deemed fit, to communicate on matters of C. importance direct with the Prime Minister of the U.K. Although the

dominions were fully consulted by the home gov. in all the peace negotiations, the termination of hostilities saw an end to the Imperial War C. as such.

The War C. of the U.K. had, of course, no formal existence. In the early days of the First World War it was felt strongly that the normal C. of 21 or 22 members was ill adapted to the requirements of war, when speedy decisions are often necessary. When under the stress of war the Coalition Gov. came into being, it naturally followed that the leaders of the constituent parties were stronger than others of the ministers, and were more frequently consulted by the Premier. As these others were content to leave matters in safe hands, the War C. was evolved. As in the case of the Imperial War C., this war creation died a natural death on the cessation of hostilities. On the outbreak of the Second World War in 1939 a War C. of 9 members was formed, consisting of the Prime Minister, chancellor of the exchequer, secretary of state for foreign affairs, minister for co-ordination of defence, first lord of the admiralty, secretary of state for war, secretary of state for air, lord privy seal, and minister without portfolio. The C. secretariat previously referred to, also a product of the war days, still survives. See also succeeding article.

The Cabinet in the United States. The development of the C. in the U.S.A. took quite a different turn from that of Great Britain which has served as the model for most of the European countries. In Great Britain the Prime Minister is the chosen leader of the political party which has the largest representation in the House of Commons, and his colleagues in the C. usually belong to the same political faith; and have to be members either of the Commons or of the Lords. In the U.S.A. the C. is named by the President. It consists of the heads of the great governmental depts who advise him. It meets with him every week and discusses questions of policy, the President's being the final word. C. ministers are not members of the Amer. Congress. In fact, if a congressman or senator is named to a C. post, he resigns his position in the Congress. It is the usual thing for the President, when he is sworn into office on inauguration day, to transmit to the U.S. Senate his list of C. officers. These have to be confirmed by a majority vote of the Senate, and this is usually done as a matter of course.

Again, in the Brit. Gov. C. ministers, being M.P.s, sit in the sessions of the House to which they belong, submit to questions by members, and take an active part in the debates, particularly in matters affecting their respective depts. No Amer. C. minister has the right to take part in Congressional debates. He can be asked for information by a congressman or senator by letter, or personal interview, or he can be summoned before a Congressional committee and asked questions. But even then he can refuse if the answer is deemed 'incompatible with the public interest.'

The Amer. C., as to size, is a matter of gradual growth corresponding to the increase in power, wealth, and business of the country. Under George Washington, the first President, it consisted of the secretary of state (corresponding to the minister of foreign affairs in Great Britain), secretary of the treasury, secretary of war, attorney-general, and postmaster-general. Under President John Adams, the second chief executive, the C. was increased by a secretary of the navy in 1798. Under President Taylor in 1849 there was added a secretary of the interior. In 1889 under President Grover Cleveland the farming interests of the country were considered so important that a secretary of agriculture was named. Under President Theodore Roosevelt in 1903 the new post of secretary of commerce and labour was created; but under President Woodrow Wilson in 1913 their duties were separated, and he named a secretary of commerce and a secretary of labour. In 1947 under President Truman the offices of secretary of war and secretary of the navy were combined into one, that of secretary of defence. Each new C. post is authorised by an Act of Congress (*see* ACT). The position of secretary of state is considered the greatest post within the President's gift, although the salary is the same as that of the other C. ministers. He not only handles foreign affairs, but is also the medium of correspondence between the President and the governors of the various states in the Union; has the custody of the great seal of the U.S.A. and countersigns and affixes such seal to all executive proclamations; and is the custodian of the treaties made with foreign nations and of the laws of the U.S.A.

There is also this notable difference from the Brit. C. system; in Great Britain, Premier and C. ministers only hold their posts so long as they have command of the House of Commons. In the U.S.A., just as the President is immovable for the 4-year term for which he is elected (unless impeached and removed), so are his C. ministers unless he asks them to resign. Thus it has often happened in the hist. of the U.S.A. that the majority in one or both houses of Congress belonged to one political party, while the President and his C. belonged to another.

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British Cabinet System, 1830-1938, 1939. See also CABINET, IMPERIAL WAR.

Cabinet, Imperial War. The I. W. C. was instituted in 1916 for the purpose of giving dominion statesmen a direct, continuous, and effective share in the decisions taken by the Brit. Gov. on questions relating to the foreign policy of the empire as a whole. The premiers and other leading ministers of the dominions were convened with Brit. ministers on a footing of absolute equality, in a Cabinet which not only discussed but decided the main questions of the conduct of the war, both military and diplomatic. In 1918 it was decided, with a view to the War Cabinet meeting continuously, that dominion ministers should be appointed to reside permanently in London as members of the Cabinet. Meantime the dominion premiers were to continue to be *ex officio* members of the Cabinet and, when unable to attend personally, communicated directly with the Brit. premier on Cabinet matters. But the system, if better than the old arrangement of conferences, was faulty in that the Imperial Gov. was not a gov. in the constitutional sense; it did not possess the unity and coherence of a gov. answerable to a single Parliament and electorate; its members were responsible to 6 different parliaments and electorates and might, obviously, be individually removed and replaced at different times and for different reasons as a consequence of political changes either in the U.K. or in the dominions which might conceivably have no sort of bearing on the imperial questions falling within the purview of the Imperial Cabinet. On the outbreak of the Second World War, in Sept. 1939, no arrangements were made for including dominion ministers in the War Cabinet, although there were frequent consultations on all-important matters of policy between the U.K. and the dominion govts. Indeed, the development in the dominions in the last 30-40 years of more independent outlook on foreign affairs has probably precluded the likelihood of the experiment of 1916-18 ever being repeated. It should, however, be noted that Casey of Australia was minister of state resident in the Middle E. and a member of the U.K. War Cabinet, 1942-3.

Cabinet-making, see FURNITURE.

Cabinet Noir, special secret dept. of the Fr. postal service, in which letters were opened and read, then reclosed and sent on. This system was first organised in France under Louis XIV, and was destroyed with all systems of the same nature at the revolution. It was again estab. under Napoleon, but was given up on the formation of the third rep.

Cabiri (Cabeiri), fertility gods of Phrygian origin, called by the Greeks 'the Great Gods'. Their number varied and they were later identified with the Corybantes and Curetes (qq.v.). As early as the 5th cent. BC they were considered as the protecting deities of sailors, which may account for their subsequent identification with *Castor*

and Pollux (q.v.). The prin. centre of their worship was in Samothrace, and their mysteries were second only to the Eleusinian in reputation.

Cable, George Washington (1844-1925), Amer. author, b. New Orleans, his father being of an old Virginian family, and his mother a New Englander. He became a clerk at the age of 14, entered the 4th Mississippi Cavalry of the Confederate Army in 1863, and at the close of the war (in which he narrowly escaped death) began his journalistic career in his native city. His *Old Creole Days*, 1879, is a series of sketches of the old Fr.-Amer. life of New Orleans. His first novel, *The Grandisimes*, 1880, gives an accurate picture of Creole life in Louisiana a cent. ago. *The Creoles of Louisiana*, 1884, was a hist. of the people, and roused considerable indignation among the Creoles themselves. In his *Dr Sevier*, 1883, which is probably his finest work of fiction, he reproduced with remarkable success the gentle Fr.-Eng. dialect of Louisiana. Life in the marshy lowlands at the mouth of the Mississippi is faithfully depicted in his short stories, *Belles Demoiselles Plantation*. Other books are *Bonaventure*, 1888, *The Cavalier*, 1901, and *Kincaid's Battery*, 1908. For some time also he ed. *Current Literature*, a New York monthly. He d. at St Petersburg, Florida.

Cable, large rope or iron chain used on ships to hold the anchor. C.s are made of hemp or jute, of galvanised or zinc wire, and of chain. Rope C.s vary from 3 to 25 in. in circumference. Hemp and wire ropes are used for towing and mooring purposes, whereas chain ropes are used on steamships, where they can be moved and manipulated by steam engines. Steam C.s are made in links in 124-fathom lengths. In the Merchant Navy the chains are made to 15-fathom lengths.

Cable Ways, in civil engineering, overhead cables, used for the transport of goods, though also used in some mt dists. for passenger traffic. Also called aerial ropeways. The cable and hauling gear are carried on trestles, which may be erected on irregular ground or carried over streams and ravines. The C. W. system has been developed in recent years owing to the increased use of electrical power for industrial purposes. Thus at the Penmaenmawr quarries, in Wales, where quarrying is carried on at heights up to 1500 ft above sea level, this system of transport of materials is of the greatest use.

Cables, Electric, insulated conductors, mainly for laying underground. C. must have sufficient conductor cross-section to carry the current without undue heating, sufficient insulation to withstand the voltage to earth and between the cores, and protection against penetration of moisture, and be flexible enough for rolling up on drums for transport. Cores are always of copper, which has the highest conductivity for a given cross-section area. **Power C.**, carrying a heavy current, have stranded cores to give flexibility, of 7, 19, 37, 61, 91, or 127 strands. These are the so-called 'circular

numbers.' Such numbers of equal strands will give a compact cross-section of near circular outline. The core is slightly twisted to prevent the strands coming apart when the cable is bent. The size of cable is specified by the number of strands and the diameter of each, 37/0.064 being a cable of 37 strands of diameter 0.064 in. each. In 3-phase C. the 3 cores are included in 1 cable, the cores sometimes being of sector-shaped cross-section. Concentric C. have a central core and one or more rings of strands round it, but insulated from the core. The insulation is built up by winding paper strips impregnated with oil round the core until the required thickness is reached. The paper-insulated cable is protected by a lead sheath, covered with a layer of jute or hessian tape, and the whole is then 'armoured' with steel wire or tape, covered with a further layer of jute saturated with tar, as protection against corrosion. In oil-filled C. the cores are arranged round a central spiral of metal tape forming a tube kept filled with oil from a pressure tank. The gas-pressure cable has no steel armouring but is enclosed in steel tubing kept filled with nitrogen at high pressure. The insulation resistance of a cable is given in megohms per m., being the resistance from the surface of the core through the insulation to the outer surface. A usual test consists in keeping a length of the finished cable under a voltage higher than the nominal working voltage, submitting it daily to alternate heating (by a current through it) and cooling and measuring the power factor (q.v.) of the leakage current periodically. The lower the power factor, the more perfect is the insulation. A constant, low power factor throughout the test period indicates reliability in service. **Power C.**, being armoured, are sometimes laid on a bed of sand and covered with tiles as a warning when the ground is being dug; sometimes in a wooden trough, on insulating bridges to keep the C. apart and off the bottom, the trough being filled with bitumin. In urb. dists. the C. are drawn through channels in ceramic blocks set on a concrete base. Manholes are provided for access to joint boxes and for testing. **Telephone C.** usually carry a large number of fine copper wires covered with dry paper. A lead sheath protects the conductors against moisture. Long-distance C. carry 4 wires—2 pairs, 1 pair for transmission each way. Co-axial C. are used in multi-channel carrier-wave telephony (q.v.). The outer conductor is a copper tube, the inner a bare copper wire placed in axial position by insulator spacers. The 2 form the pair of a circuit and 2 such tubes are needed for a 4-wire circuit. **Submarine C.** have a stranded core covered by layers of gutta-percha, para-gutta, or polythene. Submarine coaxial C. are filled with insulation to withstand the high pressure. The deep-sea portion of a submarine cable is armoured by tempered steel wire. See C. Bright, *Submarine Telegraphy*, 1898, *Story of the Atlantic Cable*, 1903, and

Life of Sir Charles Tilston Bright, 1908; P. Dunsheath, *High Voltage Cables*, 1932; C. Baines, *Submarine Cables, Testing and Working*, 1932; S. Garnham and R. Hadfield, *Submarine Cable*, 1934; 'Proton,' *Cables and Wires*, 1945.

Cabot, John (Caboto, Giovanni) (1450-1498), discoverer of N. America, was a Genoese who became a naturalised Venetian and finally settled as a merchant in Bristol. News having reached England that Columbus had discovered a vast new ter., C., in 1497, set out in the *Mathew*,

the fine merchandise of the E. To C. must be credited the discovery of Newfoundland and other fisheries.

Cabot, Sebastian (c. 1474-1557), navigator and cartographer, son of John C.; probably b. at Venice, but the place and date of his birth are alike uncertain. He has often been confused with his father; it appears more likely that it was John who undertook the voyage to the NW. Passage about 1498-8, although his son may have accompanied him. In 1512 Sebastian won a reputation in



Postmaster-General

REPAIR WORK BY A BRITISH POST OFFICE CABLE SHIP

The cable has been hooked up from the sea-bed by the grapple.

and after 52 days' sail landed on Cape Breton Is., where he planted the royal flag. His name is associated with the earliest attempts to reach India by the NW. Passage; in 1498 Henry VII granted letters patent to C. and his sons to fit out ships for the exploration of that route. C. and his sons failed, but they discovered Newfoundland and sailed along the coast of Labrador to Virginia. He had heard from João Fernandes about Greenland, and thinking it part of the Asiatic continent made his way in that direction. But once more, though he explored E. and W. the coasts of Greenland, reached Baffin Land and landed on Newfoundland and Nova Scotia, he was obliged at length to return home, baffled in his search for Cipangu, or Japan, which was to have been the open door through which England passed to reach spices and

England as a cartographer. He appears to have prepared maps of Gascony and Guienne for Henry VIII, and later in the same year to have been commissioned by Ferdinand V of Spain for a similar purpose. On the death of Ferdinand in 1516, C. abandoned his projected voyage to the NW. and returned to England in the following year. He again entered the service of Henry, and on his behalf set sail from Bristol on a voyage of discovery to Hudson Bay and Hudson Strait. (Doubts have been raised as to whether this voyage ever took place.) In 1519 C. was appointed pilot-major by the Sp. king, Charles V. In 1526, after a dispute between Spain and Portugal regarding their respective trading rights with the Moluccas, C. was sent out by Charles V to explore the coastline of Brazil. He entered the R. La Plata and

called up its trib., the Paraguay, but his attempt to make colonies was a failure. Consequently, on his return in 1530, he was imprisoned for a year and exiled to Oran in Africa for 2 years. He was subsequently restored to his former post of pilot-major, but in 1547 resigned, and soon after was welcomed in England by Edward VI. C. was chiefly instrumental in promoting and directing the Company of Merchant Adventurers (1553), which opened up Brit. trade with Russia. He was appointed governor to this company and inspector of the Eng. Navy (1547). C.'s map, showing the discoveries of himself and his father, can be seen in the Bibliothèque Nationale. See C. R. Beazley, *John and Sebastian Cabot*, 1898; H. P. Bigger, *The Voyages of the Cabots and Corte-Reals to North America*, 1903.

Cabourg, popular Fr. watering-place in the dept of Calvados, 11 m. from Trouville. It is on the R. Dives, and has a good beach and a casino. Pop. 3200.

Cabra, Sp. tn in the prov. of Córdoba. It has an anct castle and other Moorish remains, and has a trade in agric. produce. Pop. 14,000.

Cabral, Pedro Alvarez (c. 1460-c. 1526), Portuguese navigator, who was sent in 1499 by the King of Portugal to estab. a factory on the Malabar coast in India, and to win the friendship of the rajah of Calicut. C. took a westerly course, landed on the coast of Brazil, and took possession of part of the neighbouring country. He sent one of his ships back to Portugal to announce his discovery, and with his other ships he set sail for India. During the voyage 4 of his vessels were lost, and among those who perished was Diaz. C. reached Calicut, and after sev. encounters with the natives estab. a factory there. He continued to explore the Malabar coast, and returned to Portugal in 1501 with rich cargoes.

Cabrera, Ramón (1806-77), Sp. soldier, b. Tortosa. In 1833 he became a staunch ally of the pretender Don Carlos, who was supported by the absolutist party. During the war which followed he distinguished himself as much by his cruelty as by his unquestioned bravery. In 1839 Don Carlos rewarded him with the governor-generalship of Valencia, Murcia, and Aragon, and made him Count of Morella. Driven across the frontier to France in 1840, he was indignant when in 1848 his leader abdicated his rights. After attempting to revive the Carlist war, without success, he settled in England.

Cabrera (anct *Capraria*), small is. of the Balearic Isles (q.v.), lying just S. of Majorca. It is now inhabited by a few hundred farmers and fishermen, but was deserted for nearly a cent. as it was reputed to be haunted by the ghosts of many Fr. soldiers who d. here after being captured at Ballén (q.v.) in 1808.

Cabriole, word applied to the legs of tables, chairs, or other pieces of furniture, shaped as the legs of a goat, with knee and cloven foot, or merely having a double curve. The fashion was introduced in

France in the 17th cent.; and it was prevalent in England from the close of that cent. until the reign of George II. The term is also applied to chairs with stuffed shield or oval backs by Heppelwhite.

Cabul, see **KABUL**.

Cabuyao (formerly *Tabuco*), tn on the is. of Luzón, in the Philippines, situated near *Laguna de Bay*. The cultivation of coco-nuts, rice, and sugar is carried on. Pop. 15,206.

Cacao, see **COCOA**.

Caccamo, tn in Sicily (q.v.), 22 m. SE. by E. of Palermo (q.v.). It has a medieval castle and fine churches. There is a trade in almonds and wine. Pop. 10,100.

Caccia, Guglielmo (1568-1625), Piedmontese fresco painter, nicknamed 'Il Moncalvo' from his long residence there. Probably a pupil of Soleri. He painted in fresco and oil; his manner partakes more of the Rom. than the Bolognese school, but he has something of the energy of the Carracci. The church of Sant' Antonio Abbate, Milan, has frescoes of his; another work in fresco is the cupola of San Paolo at Novara. The Chiesa de' Conventuali at Moncalvo has a regular gallery of his pictures. Two of his daughters were painters.

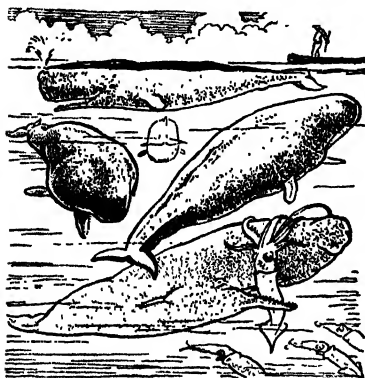
Caccini, Giulio (c. 1545-1618), It. singer and composer, b. Rome (hence called Giulio Romano), studied under Scipione de' Vecchi (della Palla) and in 1564 went to Florence, where he remained as a singer at the Tuscan court of the Medici family till his death. He is one of the group to whom are due those first attempts at dramatic music that led to opera, and he was also among the first to use monody (i.e. accompanied melody) instead of polyphony (i.e. interwoven melodic parts). He and Peri both set Rinuccini's librettos of *Euridice* and *Dafne* to music, but it is difficult to say which is the earlier setting of the former, Peri's being performed first but C.'s pub. earlier. C.'s *Dafne*, however, is certainly later. He also pub. 2 collections of *Nuove musiche* (1602 and 1614) containing examples of the monodic style. His daughter Francesca (1588-?) was also a singer and composer.

Caceres: 1. Sp. prov. in Estremadura (q.v.), bordered on the W. by Portugal. It lies largely in the basin of the Tagus (q.v.), and produces hams, wool, oil, and renowned red sausages (*embutidos*). Area 7707 sq. m.; pop. 558,950.

2. (Rom. *Norba Caesania*), Sp. tn., cap. of the prov. of C. It is built on a hill, and the old part of the tn. surrounded by Rom. and Moorish walls, is preserved as a national monument. C. is a picturesque tn, with many anct churches and towers and fine medieval and Renaissance mansions. The High Court for Estremadura sits here. Textiles, soap, and leather goods are manuf., and there is an agric. trade. Pop. 47,100.

Cachalot, or **Sperm Whale** (*Physeter catodon*), the only representative of its genus, is a huge toothed whale, measuring as much as 60 ft in length. It is found in all tropical and subtropical

seas, being usually met with in a herd or 'school,' consisting often of some hundreds. The bulk of head, which takes up a third of its body, is made up of tough fat or 'junk,' round which is a great 'case.' The refined oil from this case yields spermaceti. This substance is still used in ointments, and 12 barrelsful can be obtained from 1 animal. Verging to the left, at the anterior extremity of the head, is the blow-hole, whilst the mouth, which is some way behind the end of the snout, is ventral. Excellent ivory in small quantities may be obtained from the teeth (about 22 in number), which line each side of the lower jaw. This jaw, which



CACHALOTS

is very narrow, may be let down so as to make an enormous gape. The throat is said to be wide enough to allow the whale to swallow a man, and it is thought to be this species which swallowed Jonah. The head is very massive, high and truncated in front; the flipper is short and broad, and the dorsal fin merely a low protuberance. In colour it is black above and grey beneath. Sperm whales feed chiefly on squid and cuttlefish and are rarely seen in European waters. Ambergris, which is used in perfumes, is an intestinal secretion of this species; it is often found on the sea. There is also a pygmy sperm whale (*Kogia breviceps*) which reaches a length of 9 to 13 ft.

Cachet, Lettres de, see LETTRES.

Cachexia (Gk. for an evil condition), term used in medicine to express a thoroughly unhealthy condition of the body, such as that occasioned by insufficient feeding and above all by chronic maladies. Disseminated secondary cancerous growths typically cause C.

Cachoeira (waterfall), port of Baía, Brazil, 40 m. NW. of Baía, on the R. Paranaquá. It has a considerable export trade in sugar, and tobacco. Pop. about 11,000.

Cachoeira de Itapemirim, rail junction on Itapemirim R., state of Espírito

Santo Brazil. Industrial and agric. centre. Pop. 24,600 (many Germans).

Cacholong, beautiful mineral, looked upon as a variety of semi-opal. Usually it is milk-white in colour, but it sometimes has pale red and yellow tints. It is porous, and has a lustre rather like that of mother-of-pearl, whence it is often called pearl opal. The word is likely to be of Tatar origin, but it is popularly supposed to have been named after the R. Cakh in Bokhara.

Cachucha, Sp. dance of Andalusia of pronounced national character, written in 3-4 time. The dancer holds castanets, and the dance, which is graceful and voluptuous, gradually increases in speed. The head and shoulders play an important part.

Cacique, title equivalent to lord or prince, borne by native chiefs of Mexico, Peru, central America, Haiti, Cuba, and the W. of S. America at the time of Sp. exploration. More recently the title has been given to chiefs of independent Indian tribes. It is the title given to Arawak chiefs in the W. Indies in the accounts of the journeys of Columbus by Bernaldez and Peter Martyr.

Cacodaemon, see DEMONOLGY.

Cacodyl ($\text{As}_2(\text{CH}_3)_4$), or tetramethyl diarsine, is a colourless liquid boiling at 170°C . It is very poisonous, and its smell is so offensive that it was named by Berzelius from a Gk word meaning stinking, a trace of the vapour in a room being sufficient to render it intolerable. It is derived from a product known as 'Cadet's fuming liquid,' first formed by Cadet in 1760 by distilling white arsenic and potassium acetate. This liquid is fuming and spontaneously inflammable, consisting among other things of C. oxide and a little C., the latter causing the spontaneous combustion. This liquid is distilled with hydrochloric acid and corrosive sublimate and C. chloride is produced, whence C. is obtained by heating with zinc. The true nature of C. and its derivatives was discovered by Bunsen in a prolonged research about 1840. In chemical action it acts like an electrically positive element, forming an oxide, chloride, iodide, and cyanide. An acid called cacodylic acid is formed when the oxide is acted upon by mercuric oxide, and the salts are sometimes used for skin diseases. C. cyanide is a colourless liquid obtained by distilling the oxide with mercury cyanide. The operation must be performed with extraordinary care in the open air, since the volatile vapour is among the most poisonous substances known.

Cactus (plural Cacti), common name now given to plants of the family Cactaceae, though also to one genus of the family. They are characterised by very succulent stems, with absent or reduced leaves, bearing spines on a special organ, known as the areole, often together with bristles, hair, felt, or wool. The plants vary in size and shape, and stems may be flat, spherical, ribbed, triangular, columnar, or tuberculate. Their flowers are stemless, but varied in size and colouring, with numerous stamens, a slender divided

style, and berry fruits, often edible, containing many seeds. Most *C.* are terrestrial, a few epiphytic in warm, moist parts of central America. Almost all *C.* occur naturally only in America, particularly in Texas, Mexico, Lower California, Argentina, Chile, and Peru, but have naturalised in Mediterranean countries, S. Africa, and Australia. They are especially adapted in structure to live in hot dry regions and deserts, with stems that hold much water, and thickish skins of low surface area that reduce transpiration and evaporation to a minimum. They are often a source of water and subsistence in man and beast in deserts where no other vegetation will grow. The species number about 2000, now grouped into 3 tribes: *Pereskieae*, represented by 1 genus, *Pereskia*, with woody stems and broad fleshy leaves; *Opuntiae*, with succulent stems, small, soon falling leaves, sessile flowers (e.g. *Opuntia*, *Pterocactus*, *Gruonia*, etc.); and *Cerecae*, with succulent leafless stems, single, sessile flowers with a tube. The last is the largest tribe, having 8 sub-tribes: *Cereanae*, terrestrial (e.g. *Binghamia*, *Cereus*, *Heliocereus*, *Nyctocereus*, etc.); *Hylocereanae*, epiphytic (e.g. *Aporocactus*, *Hylocereus*, *Selenicereus*, etc.); *Echinocereanae*, low terrestrial plants (e.g. *Chamaecereus*, *Echinocereus*, *Echinopsis*, *Lobivia*, *Rebutia*); *Echinocactanae* (e.g. *Echinocactus*, *Ferocactus*, *Mila*, etc.); *Cactanae* (e.g. *Cactus*, *Melocactus*, *Discocactus*); *Coryphanthanae* (e.g. *Mammillaria*, *Thelocactus*, etc.); *Epiphyllanae*, epiphytes (e.g. *Disocactus*, *Epiphyllum*, *Zygocactus*, etc.); and *Rhipsalidanae* (e.g. *Leptium*, *Rhipsalis*, etc.). The cultivation of *C.* is highly popular, and not difficult if it is remembered that they are naturally accustomed to a long, dormant period of drought, and a short growing one of rain. They need a porous soil of sifted loam, mortar rubble, broken brick, and coarse sand. Epiphytes need peat added. Potting is usually done in early spring: watering increased as the days lengthen and grow warmer, and reduced as they shorten, with little or no water in the cold weather months. See G. Gilbert Green, *Cacti and Succulents*, 1953.

Cacus, son of Vulcan (q.v.), notorious robber and giant. He lived in a cave on Mt Aventine, where he stored the proceeds of his raids. Having stolen and dragged into his cave some of the cattle Hercules had brought from Spain, he was killed by that hero. The cattle within the cave lowed in response to the lowing of the remainder of the herd as they were passing the entrance of the cave.

Cadamo, or **Ca' da Mosto**, Alvise (Luigi) da (1432-77), explorer, was b. at Venice. In 1456 he undertook a voyage to the Canaries, and as far as the mouth of the Gambia. In 1456 he made a voyage to Senegambia, discovering Cape Verde Is. His account of his discoveries was pub. in 1507.

Cadastral, see **MAPS**.

Cadaverine, or pentamethylenediamine; formula $C_5H_{14}N_2$, a colourless liquid of

ammoniacal odour, which occurs as a product of putrefaction in rotten meat and other foods which contain the amino-acid lysine. Also occurs to some extent in cheese. It is isolated by extracting the putrefaction mixture with alcohol and by precipitation with alcoholic mercuric chloride solution.

Cadbury, George (1839-1922), Quaker cocoa manufacturer and philanthropist, b. Edgbaston, Birmingham, son of John C., tea and coffee merchant and cocoa maker in a small way. In the 1860's George and his elder brother Richard took over their father's cocoa and chocolate factory. They introduced into England the modern method of producing cocoa powder by extracting part of the natural oil of the raw bean, greatly extended the range and variety of confectionery chocolate, and introduced the first Brit.-made decorated boxes. In 1879 they moved to Bournville, then outside the city, where George carried out his experiments in housing and in planning. In 1900 the estate was made over to a trust under the Charity Commission. In 1901 George became part-owner of the *Daily News* (now the *News Chronicle*); later he was its chief proprietor. George C. was much interested in social questions, particularly housing, old age pensions, and the adult-school movement. See A. G. Gardiner, *The Life of George Cadbury*, 1923.

Caddis Flies, order of insects (Trichoptera) allied to certain of the simpler Lepidoptera. The grub or larva is aquatic, feeding on water plants, and living enclosed in a sheath of stick and gravel, held together by silk. This protection is necessary, as the body is long and soft and much sought after by fish. The adult is a 4-winged, air-breathing insect not unlike a dull-coloured dragonfly with a sucking proboscis instead of jaws. It feeds on the juices of plants. Its chief characteristic features are a small head, compound eyes, hemispherical in shape, 3 eye-spots, and few or no transversal veins; the wings are covered with hairs. Adults are particularly active at night. Eggs are laid in gelatinous masses on plants, stones, or in water. The larvae build cases or tubes in which they live, composed of minute fragments of wood, grass, leaves, or shell. Within these sheaths the larvae are both sheltered and protected. When the time for pupation arrives, the *C.* worm closes the ends of the tube with silk, or by attracting small stones. The pupa metamorphosis then begins, and at an advanced stage the pupae burst their prisons and swim or creep about for a while before undergoing the change into aerial life. Some float on the top in their cases and then take flight. They occur chiefly in Europe, and a large percentage of species may be found in Great Britain. Some of the most noted genera in Britain are *Phryganea*, *Limnephilus*, *Brachycentrus*, *Apantia*, *Mollamia*, and *Selodes*. The larvae are common in ponds and streams in spring, and are used as bait by anglers.

Cade, John (d. 1450), Eng. rebel, leader of the Kentish rising of 1450, called Jack C.'s Rebellion. The early facts of C.'s life are obscure. He seems to have been a man of some substance in Kent, and, according to some sources, claimed to be Mortimer, the Duke of York's cousin (for a different view on this see Gairdner). He headed a march of rebel Kent and Sussex yeomen on London. C.'s *Complaint of the Commons of Kent* objected to the king's favourites, excessive taxation, and general mis-gov. Another paper, *Requests by the Captain of the*

conventional progression). C.s are like punctuation marks in the language of music. They may give an effect of finality, of mere pausing, or of questioning. The varieties are known as perfect, imperfect, and interrupted. A *perfect C.* must have its final chord on the tonic. If the penultimate chord is on the sub-dominant, the C. is called plagal; if on the dominant, authentic. The harmony of the *imperfect C.* is often that of the perfect reversed, ending on a dominant chord preceded by the tonic (half close, incomplete like a semicolon). If any



Miss M. Wight

CADER IDRIS FROM THE NORTH-EAST

Great Assembly in Kent, demanded the dismissal of certain ministers of Henry VI. The king's troops were defeated in a skirmish at Sevenoaks, the rebels pressing on to London. C. had Baron Saye and Sele and Crowmer, sheriff of Kent, beheaded, but was repulsed at London Bridge. Terms of peace were arranged, but C. refused to admit defeat, though most of his supporters returned home. He went into hiding and was finally killed at Heathfield. See J. Gairdner (editor), *Three Fifteenth-Century Chronicles*, 1880, and J. Clayton, *The True Story of Jack Cade*, 1909.

Cadenabbia, It. health resort in Lombardy (q.v.), on the W. shore of Lake Como (q.v.). The 18th-cent. Villa Carlotta near by has famous gardens and many art treasures. Pop. 3000.

Cadence (Lat. *cadere*), the 'fall' or close of a musical phrase or period (often applied to the last few chords of a

except the tonic follows the chord of the dominant, the effect is that of avoiding or postponing. This is known as *avoided*, *deceptive*, or *interrupted C.* The chord substituted for the expected tonic gives an effect of surprise.

Cadency, see **HERALDRY**, *Differencing*. **Cadenza**, in music signifies an ornamental flourish introduced by a soloist near the close of a piece or section of a piece. The word is Italian for cadence, and indeed the C. is simply an elaboration of a full close by the interpolation of florid matter between its chords. C.s were formerly improvised, but now the C. is nearly always written by the composer or some other musician, and affords the executant an opportunity of showing his ability.

Cader Idris (Chair of Idris), picturesque mt (2927 ft) in Merioneth, Wales. It is composed of basalt and porphyry, with beds of slag and pumice. It can be

ascended from Minfordd on the Tal-y-Llyn side, or from Dolgelly. The area is particularly interesting to botanists and geologists, and part of it was recently declared a nature reserve by the Nature Conservancy.

Cadet (military) (Fr. from O.F. Lat. *caput*, with dimin. -et) *si*..... youth studying for the army at the Royal Military Academy, Sandhurst, and serving in a pre-military training unit. In France any officer junior to another is a C. in respect to him.

Naval cadet signifies the lowest rank of officer in the R.N. Entrance is by competition. Nomination is in the hands of the Board of Admiralty. Naval Cs enter the R.N. College, Dartmouth, at the age of 18 and are promoted midshipman after 1 year (3 terms). See MIDSHIPMEN and NAVAL EDUCATION.

Cadet Force. The cadet movement in Great Britain was inaugurated in 1859, when a few units were formed, but a great impetus was given to it in the following year when a wave of patriotism spread over the country and brought into being the Volunteer Force. These 2 forces grew up side by side, the C. F. for boys and Volunteer Force for adults. The public schools were largely responsible for fathering the C. F., but the social advantages inherent in physical training, discipline, etc., soon appealed to those interested in the welfare of boys in tns, and units sprang up everywhere. The movement made an appeal to religious workers, and before the end of the cent. such excellent bodies as the Church Lads' Brigade made their appearance. Although most units were modelled on the infantry arm, a cadet battery with 9-pounder guns was formed at the Royal Naval School, Eltham, whilst the cadet units at Reading and Tonbridge schools specialised in field engineering. At a later date the movement spread to the dominions. In 1908 the public schools unit became the junior div. of the Officers Training Corps, and a monetary grant was made from public funds, and the units were affiliated to units of the Territorial Force. In 1914 the strength of the force was over 40,000. During the First World War the cadets performed a variety of duties at home, and the strength rose to over 120,000. On 1 Nov. 1930, when a Labour Gov. was in office, the grant from public funds was withdrawn and the force entirely separated from the army. The grant was restored in 1937 and the C. F. eventually numbered 180,000. Units formed on a purely local basis and those in secondary modern schools now form part of the Army C. F. Those in schools where education is normally continued until the age of 17 are part of the Combined C. F. This latter force, which came into being in 1949, absorbed the school Junior Training Corps unit (previously junior div. of the O.T.C.). It comprises an army, naval, and air force section. See also TRAINING CORPS, OFFICERS. See Army C. F. Association, *The Army Cadet Force*, 1949.

Cadi, or Kadi (Arabic, 'judge'), title of an inferior judge among Muslim nations; possesses civil and criminal jurisdiction, his powers including infliction of the capital penalty; originally also a theologian, as all Muslim law is based on the Koran. A court of appeal, originally presided over by the caliph, revises the judgments of the C.'s court. In Turkey he is appointed by the head of the Muslim Church and known as 'Nalb', receiving a fixed salary. In Persia (Iran) and the Middle E. the office is of a more private nature.

Cadillac, Fr. tn in the dept of Gironde, on the Garonne. It produces white wine. Pop. 2800.

Cádiz: 1. Sp. prov., in Andalucía (q.v.), washed by both the Atlantic and the Mediterranean, and separated from Morocco by the Strait of Gibraltar (q.v.). It is very fertile, and is famous for its sherry (see JEREZ DE LA FRONTERA). There are rich mineral deposits. Area 2828 sq. m.; pop. 727,900.

2. (Anct Gaddir), Sp. city, cap. of the prov. of C. It is on the Atlantic coast, and is built on a small peninsula on the S. side of the Bay of C. It is said to have been founded in the 11th cent. bc by the Phoenicians (q.v.). In 206 bc it fell to the Romans, under whom it became very prosperous. It was taken by the Visigoths (see GOTHs) in the 5th cent., by the Moors in 711, and it was sacked by the Normans in 813. In 1262 Alfonso X joined it to Castile (q.v.). After the discovery of America it became a port of great importance. In 1587 Drake burned ships in the harbour, in 1596 the tn was sacked by the Earl of Essex, and in 1625 an Eng. attack was repulsed with heavy losses. The celebrated constitution of 1812 (see SPAIN, *History*) was promulgated here. C. is considered to be one of the most beautiful of Sp. tns, with its fine streets and squares and its white, balconied houses. Parts of the old fortifications remain, but the tn has comparatively few anct buildings. The neo-classic cathedral dates from the 18th cent.; the old cathedral was burnt by the English in the attack of 1596. The church of Santa Catalina contains a notable collection of works by Murillo (q.v.) with the painting on which he was working when he was fatally injured. C. has a medical and scientific faculty in connection with Seville Univ. and has a naval harbour and shipbuilding yards at La Carraca. The prin. exports are wines, salt, fish, fruits, cork, and oil. Pop. 103,650.

Cadman, Charles Wakefield (1881-1946), Amer. composer, b. Johnstown, Pennsylvania. He studied music in Pittsburgh, where he afterwards served as music critic on the local papers and organist in various big churches. Later he went to Denver and finally settled at Los Angeles, where he d. He became an authority on the music of the Amer. Indians. In 1909 he visited the Omaha Indian reservation and secured gramophone records of their songs and flute pieces. Among his better-known compositions are *Four Indian Songs* and an

Indian song-cycle, *From Wigwam and Teepee*, and a cantata for male voices, *The Vision of Sir Launfal*. His *Shanewis*, produced at the Metropolitan Opera House, New York, in 1918 and 1919, is the first strictly Amer. opera to have lived beyond one season. His opera, *A Witch of Salem*, was produced in 1926 by the Chicago Civic Opera Co. His *Thunder-Bird* suite for orchestra is based on melodies of the Blackfeet Indians.

Cadmium, metallic chemical element (symbol Cd, atomic weight 112.41, atomic number 48), discovered in 1817 by Strohmeyer in a sample of zinc oxide. It occurs as a constituent of most zinc ores and in the form of the sulphide in the mineral greenockite, found near Greenock in Scotland and in Bohemia and Pennsylvania. In the smelting of zinc ores the vapours of C. come off at an early stage, so that the metal can be extracted from the first portion of the condensed dust. C. is a tin-white metal and takes a good polish. When sublimed in a current of hydrogen it forms octohedral crystals, and when formed by electrolysis the sulphate and subliming the vapour in a vacuum it crystallises as flat needles. It melts at 231.7°, has a boiling point of 767° C., and a sp. gr. of 8.6. Wood's metal, which has a melting point of about 68° C., contains C. in alloy with lead, tin, and bismuth. C. is also used in electro-plating. Recently C. has been used in the atomic pile to retard the reaction by which U^{235} is converted to U^{238} . A coating of C. is very resistant to sea-water. *C. oxide*, CdO , is the 'brown blaze' of zinc smelters, and is also found as a mineral. *C. hydroxide*, $Cd(OH)_2$, is formed as a white precipitate on adding an alkali hydroxide to the solution of a salt of C. *C. chloride* is prepared by evaporating a solution of the metal or oxide in hydrochloric acid. *C. iodide* is obtained by dissolving the metal in hydriodic acid. *C. sulphide* is the mineral greenockite, and can also be produced as a yellow precipitate by passing H_2S into a cadmic solution. It is used as a pigment. *C. sulphate* is used medicinally in eye diseases. C. is bivalent, and the so-called cadmic salts are probably mixtures of bivalent C. compounds and the finely divided metal.

Cadmus, son of Agenor of Phoenicia and Europa's brother. When Zeus carried Europa off C. was sent to bring her back, but failed. The Delphic oracle bade him give up his quest, follow a cow he was to meet, and build a city where she lay down. He followed her from Phocis to Boeotia, and founded Thebes, the acropolis being called the Cadmeia. C. then slew a dragon, at Athene's command sowing the teeth, from which sprang armed men, Sparti ('sown'), who fought together till only 5 remained, from whom the Thebans claimed descent. C. married Harmonia, daughter of Aphrodite and Ares, and finally retired to Illyria as king. Probably C. was originally a Boeotian hero. The introduction into Greece from Phoenicia or Egypt of an alphabet of 16 letters is ascribed to him, and he was

considered the inventor of useful arts and of civilisation generally.

Cadmus of Miletus, legendary Gk logographer and reputed author of a hist. of Attica. Suidas mentions 3 writers so called; but the first 2 are no doubt identical with the Phoenician Cadmus.

Cadoc the Wise, St (d. c. 570), Welsh martyr, who founded the abbey and school of Llancarvan, in Glamorganshire. According to the most trustworthy accounts, he later migrated to Brittany. Having returned to Britain he was martyred by the pagan Saxon invaders near Weedon. His feast is on 24 Jan. Certain old proverbs and fables, *Doethineb Cathwg Ddoeth* (*Wisdom of Cadoc the Wise*) and *Dammegion Cathwg Ddoeth* (*Fables of Cadoc the Wise*) have been ascribed to him.

Cadogan, William, 1st Earl (1675-1726), general. It is thought that he took part as a boy cornet at the battle of the Boyne in 1690. He fought under Marlborough as a quartermaster-general in all his great battles from 1701 to 1711, and was colonel of 'Cadogan's Horse,' 1703-12. C. was sent on a diplomatic mission to the Netherlands (1707-10); appointed lieutenant of the Tower, 1709-1715, and Governor of the Isle of Wight, 1716. M.P. for Woodstock, 1705 and 1714. He rose to the rank of general in 1717, and was created a baron in 1716 and earl in 1718.

Cadore, see PIERRE DI CADORE.

Cadorna, Marshal Count Luigi (1850-1928). It. soldier, b. Pallanza, son of Gen. Count Raffaele C., a famous soldier who fought beside Brit. and Fr. troops in the Crimean War. He early showed such high military talent that he was appointed to the general staff even before passing out of the Military Academy. He was a profound student, not merely of military subjects, but of science and topography. Promoted captain in 1875; then commanded the 10th Bersaglieri; and in 1898 became major-general, with so good a reputation as a director of military training and as a leader in the field that in 1907 he was marked out as future chief of the staff. But it was not until 1914 that he reached this post, the appointment being of good augury for the allied cause in the First World War, because his whole upbringing made C. an admirer of England and opposed to a policy of military co-operation with the Central Empires. In the conduct of the operations on the It. frontier he displayed his undoubted powers of leadership and sound strategical judgment; and if his tenure of the command was clouded by the disaster of Caporetto (q.v.) there is much evidence that he was the victim of circumstances, and that had the Allies followed his advice he might have been able to resist the Ger.-Austrian offensive. The fact that he was created a Marshal of Italy simultaneously with his successor, Marshal Diaz, is some indication of the esteem in which he was held by his countrymen. It is probable that C. risked too much in advancing eastward while ignoring the importance of the Trentino front.

Indeed the Austrian offensive in the ensuing year (1916) might have had the effect of compelling him to withdraw his E. armies but for Brusilov's (q.v.) remarkable attack on the Austrian rear (see RUSSIAN FRONT, FIGHTING ON THE). Italy was quite unprepared for war in 1914-15, her armies being ill-disciplined and anti-militaristic. It has been suggested that the allied leaders, at a conference at Rome in 1917, showed an inability to appreciate the importance of the It. front, and that they declined to help C. with reinforcements. C. felt impelled to make the best of the situation by launching a series of forlorn assaults on the Isonzo, which, while weakening the Austrian armies most appreciably, so undermined the morale of the It. troops by the protracted nature of the operations that Caporetto was the result. The Allies then made all possible sacrifices to strengthen and reorganise the It. front. C.'s command, however, came to an end, but at Versailles, where he had been transferred to the Allied Military Council, his military insight greatly impressed his colleagues. As the consequence, however, of the Caporetto inquiry, he was removed from the council and retired (Aug. 1918). All the points in his campaign and its results are brought out in his book *La Guerra alla Fronte Italiana*, which he pub. in 1921.

Cadoudal, Georges (1771-1804), Fr. rebel leader, b. near Auray, Brittany. He was among the first to take up arms against the rep., was captured in 1794, escaped, and organised a peasant army, which was never subdued. Bonaparte recognised his ability, activity, and character, and tried unsuccessfully to win him over. C. crossed to England, was made lieutenant-general by the Comte d'Artois, and in 1803 returned to France with the intention of overthrowing Bonaparte. He was captured and guillotined. His family was ennobled after the restoration.

Cadotxon, see **HARRY** (2).

Cadre (Fr., 'frame'), military term denoting the nucleus of a unit or regiment, consisting of the permanent estab. of officers and N.C.O.s around whom a complete unit or regiment can be built.

Caduceus, name originally for an enchanter's wand, but later also a herald's staff. Hermes, or Mercury, always carried such a staff. It had 3 shoots, 1 of which made the handle, the other 2 being intertwined at the top.

Caduceus' Wand, see **DIVINING ROD**.

Caduroi, see **QUERCY**.

Cadwallon, spelt also **Caedwalla** (d. 633), King of Gwynedd, S. Wales. He allied with Penda of Mercia and in 632 defeated and killed Edwin of Northumbria at Hatfield Chase. The following year he was himself defeated and killed near Hexham by Edwin's nephew, Oswald. He is the only known Brit. king in historic times who crushed an Eng. dynasty.

Cadzand, or **Kadzand**, vil. situated in the prov. of Zeeland, Netherlands, 14 m. NNE. of Bruges, near the mouth of the R. Scheldt. Sir Walter Manny and the

Earl of Derby defeated the Count of Flanders here in 1337.

Caeclia (Lat. *caecus*, blind), snake-like amphibian, of the order Apoda, about which little is known. It has a worm-like body, without tail or limbs and marked with ring-like grooves. These amphibians inhabit warm countries and damp places, and burrow like earthworms. They are 20 in. long, with the thickness of a large worm, and are found in America, India, and Africa. Some species lay eggs while in others the female gives birth to living young.

Caecilius Statius, Quintus (d. 168 bc), popular Rom. comic poet and dramatist, b. Milan; a slave when young, he became a friend of Ennius. He is mentioned by Cicero (*De Optimo Genere Oratorum*, i; *Ad Atticum*, vii.; *De Finibus*, ii. 7) and Horace (*Epistulae*, ii. 1). Only short fragments of his works remain, chiefly in Aulus Gellius. See E. H. Warmington, *Remains of Old Latin*, I (Loeb Library), 1935, and G. E. Duckworth, *The Nature of Roman Comedy*, 1951.

Caecum (Lat. *intestinum caecum*, the blind gut), sac open at one end only, situated at the point of junction of the small with the large intestine. It is not connected in man with any process, but in herbivorous animals it is probably an aid to digestion, secreting a gastric fluid. The vermiform appendix enters the C. at its posterior and inner surface about 1 in. below the ileo-caecal valve. See **under** **INTESTINE**.

Caedmon (d. c. AD 680), earliest Eng. Christian poet, 'father of Eng. song.' The only trustworthy information about him is in Bede's *Ecclesiastical History*, i. c. He was a servant at Whitby monastery, where one night he had a vision, and a voice bade him sing 'the origin of created things.' 'Thus sang he of the creation of the world, and the beginning of the race of men, and all the hist. of Genesis . . . also of the terrors of the future judgment and the horrors of hell-punishment, and the sweetness of the heavenly kingdom' (Bede). C.'s *Paraphrase*, as described by Bede, was thought to be embodied in a MS. of sacred epics, now in the Bodleian Library, Oxford (titles of poems being *Genesis*, *Exodus*, *Daniel*, *Christ*, and *Salan*), but the best critics reject them, though they are possibly by later disciples. The theme anticipates that of Milton's great epics. The hymn which C. was supposed to have composed in his dream is in Northumbrian dialect, and is preserved in a MS. of Bede's *History* now at Cambridge. A memorial cross was erected at Whitby in 1898. See A. E. Smith, *Three Northumbrian Poems*, 1933.

Caelio, Alberto, see **PESOA, FERNANDO**.

Caelius Antipater, Lucius, see **COELIUS**.

Caelius Aurelianus, eminent Lat. physician and medical writer, b. Sicca in Africa (fl. end of the 4th cent. AD). He was an exponent of the 'methodic' school of medicine. He has left 2 valuable Lat. texts, taken mainly from the work of Soranus of Ephesus, *De Morbis Chronicis* and *De Morbis Acutis*. The text of these, with new Eng. trans. by I. E.

Drabkin, was pub. in 1950. There are also fragments of his *Medicinales Responsiones*, a general treatise on medicine, in which his *Gynaecia* is abridged from Soranus's *Peri gynaikion pathon* (eds. Amman, 1709; Haller, 1774; Rose, *Anecdota Graeca et Latina*, II, 1870). His writings were considered more practical than those of any other medical authority of antiquity. See Kuehn, *Programma de Caelio Aureliano*, 1816.

Caelum, small constellation W. of Columba and S. of Eridanus, containing no bright stars. It is too far S. to be seen in the Brit. Isles.

Caen (Lat. Cadomum), Fr. tn, cap of the dept of Calvados, on the Orne, 7 m. from the Eng. Channel and 124 m. by rail from Paris. It is in a fertile plain, the 'Campagne de Caen' which is a prosperous agric. and horse-breeding dist. The tn has a busy port, connected to the sea by the Orne canal. Near by is the 'Prairie' with its raccourse, and also the celebrated subterranean stone quarries, from which comes the C. stone widely used in England and elsewhere from the 11th cent. onwards; Cologne, Winchester, and Canterbury cathedrals are built of it, also Henry VII's Chapel at Westminster, and it is still used. C. has long been an intellectual centre, the 'Athens of Normandy,' and has a univ. founded in 1432 by the Eng. regent, the Duke of Bedford. The tn is very old, dating from at least the 9th cent. It was taken by Edward III in 1346, and again taken by the English in 1417 and retained by them until 1450. In the 17th cent. C. was a Huguenot stronghold, and lost many of its leading citizens after the revocation of the Edict of Nantes in 1685. In 1793 many Girondists (q.v.) took refuge in C. after the fall of the Gironde, and it became the centre of the federalist attempts against the Convention. It was from C. that Charlotte Corday set out to kill Marat. C. is a tn of splendid churches. The Church of St-Etienne (also called the Abbaye-aux-Hommes) was founded by William the Conqueror. A monument there set up to him by Wm Rufus was destroyed in 1562 by the Huguenots, the church also being much damaged. It was restored early in the 17th cent., a marble slab marking William's former resting-place, with the inscription: 'Here lies the unconquerable William the Conqueror, Duke of Normandy, King of England.' The Church of the Trinity (also called the Abbaye-aux-Dames) was founded by William's wife, Matilda, who was buried in the choir. The Church of St-Pierre, known for its magnificent tower, lost its spire during a bombing raid in 1944. The tn suffered very severely during the campaign in Normandy in 1944 (see WESTERN FRONT IN SECOND WORLD WAR, INVASION OF NORMANDY), over half the tn, including the univ., being demolished in the tremendous aerial bombardments of June and July. There has been extensive rebuilding. The restored univ. was inaugurated in 1957. C. has iron, silk, and leather manufs., engineering works, and a considerable trade in agric. produce. Coal is

imported, and iron and steel are exported. Malherbe, Huet, and Aubert (q.v.) were natives of C.; Beau Brummell was consul at C. and died in a lunatic asylum there. Pop. 62,000. See L'Abbé de la Rue, *Essais historiques sur la Ville de Caen*, 1820-42; E. de R. de Beaurepaire, *Caen illustré*, 1896.

Caerdydd, see CARDIFF.

Caere, see CERVETERI.

Caerlaverock, rural par. in Dumfriesshire, Scotland, on the Solway Firth about 6 m. from Dumfries. It is famous for its ruined castle, the seat of the Maxwells. Pop. 710.

Caerleon-on-Usk (Rom. Isca Silurum), tn in Monmouthshire, England, 3 m. NE. of Newport; pop. about 5000. Isca Silurum, planned by Sextus Julius Frontinus, governor of Britain AD 74-8, was the H.Q. of the Second Legion, which arrived there about the year 75 and remained for cents. The place was a focal point from which a network of roads spread W. and N. into Wales; it was therefore one of the most important points in Rom. Britain. The military quarters and amphitheatre had already been excavated when, in 1954, there was discovered on an adjacent site a large tn, distinct from, but once dependent on, the fortress; it was occupied, as were similar tns at York and Chester, by the wives and families of the legionaries.

Caernarvon, co. tn of Caernarvonshire, N. Wales, situated on the Menai Straits, 68 m. W. of Chester by rail. It was once the Rom. station Segontium (Caer Seint), the cap. of the Segontiaci. The castle, one of the finest examples of medieval fortification in the Brit. Is., lies to the W. of the tn. It was built by Edward I in 1284, and is in excellent preservation. It is an irregularly shaped building with 13 polygonal towers; the famous Eagle Tower was built by Edward II. The castle was besieged by Owen Glendower in 1402. The investiture as Prince of Wales of Prince Edward took place at the castle on 13 July 1911. The par. church lies outside the tn at Llanbeblig. C. is a municipal bor. and market, and the chief industries are agriculture, printing, coarsery, leather cloth, shipbuilding, fishing, and tanning; slate is also exported. Pop. 9300. C. Bay, to the S., is a favourite summer resort.

Caernarvonshire (Welsh, *Caer-narfon*, *Caer-yn-Arfon*), co. of N. Wales, bounded N. by the Irish Sea, E. by Denbigh and Merioneth, S. by Cardigan and Tremadoc Bays, W. by Caernarvon Bay and the Menai Straits, dividing it from Anglesey. In ant. times C. was inhabited by the Segontiaci; from here Agricola effected the conquest of Anglesey; many remains of Brit. earthworks, etc., are to be found in various parts of the co. The area of the co. is 569 sq. m., and a large part of it is occupied by the Lleyn Peninsula jutting out into the Irish Sea and forming Caernarvon and Cardigan Bays. C. contains some of the finest scenery in Wales, with splendid mts and beautiful valleys. The mts include Snowdon (Y Wyddfa or Eryri), 3560 ft, the highest point in

England and Wales, at the foot of which lie the well-known valleys of Boddgeiort and Llanberis. Carnedd Llewelyn (3484 ft.) and Carnedd Dafydd (3426 ft.). The tidal R. Conway is navigable for about 12 m. and divides Caernarvon from Denbigh; the Nant Ffroncon runs through the Betws-y-Coed valley to Beaumaris Bay; the co. also boasts of many lovely lakes, including Llyn Ogwen, a m. long and 984 ft. above sea level, and resorts such as Criccieth with its castle, Llandudno, Conway, Penmaenmawr, Llanfairfechan, etc. Lead and copper are found, and the slate quarries, especially those at Ponrhyll and Dinorwic are most productive. Sheep farming is carried on in the valleys and Welsh ponies are bred here. C. is in the diocese of Bangor, with a small portion in St Asaph. It returns 2 members to the House of Commons. Pop. 124 100.

Caerphilly (fort of the trench), urb. dist., par. and mkt. tn of Glamorgan, Wales, 7½ m. from Cardiff, with ruins of a castle, once one of the largest strongholds in the kingdom. There are large collieries, by-product plants, factories, and locomotive works near by. C. gives its name to a variety of cheese. Pop. 36,000.

Caerwent, vil. of Monmouthshire, Wales, 6 m. W. of Chepstow, formerly *Venta Silurum*, the only Rom. tn estab. in Wales, covering some 44 ac. and made while the fortress at Isca Silurum (see CAERLEON-ON-USK) was being built. The church, dating from the 13th cent., incorporates much Rom. material. Pop. 2000.

Caesalpinia, tropical genus of Leguminosae consisting of trees and shrubs, many of which are hook-climbers, and sev. being of commercial value. *C. pulcherrima*, Barbados Pride, is cultivated for its beautiful flowers, as are *C. septaria*, Mysore thorn, which bears yellow flowers, and *C. japonica* and *C. gilliesii*, which will flourish out of doors. *C. brasiliensis* yields Pernambuco or Brazil wood, valuable for its red dye, while *C. sappan* yields sappan-wood or bukkum wood. *C. coriaria* is known as the Divi-divi tree and *C. bonducella* yields bonduce seeds.

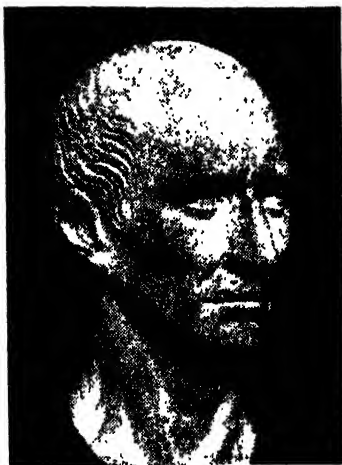
Caesalpinus, Andreas (Latinised form of Andrea Cesalpino) (1519-1603), lt. botanist and physiologist, b. Arezzo in Tuscany. He studied at Pisa and afterwards became a prof. there, where he had charge of the botanical museum. His chief work was pub. in Florence in 1583 under the title of *De Plantis Libri XVI*.

Caesar, originally the name of a patrician family of the gens Julia in ant. Rome. Adopted by Augustus as heir of Julius Caesar, it continued to be borne, not as a name but as a second title by the emperors even after the direct line of the Julian family had become extinct. From the time of Hadrian it was also used as the title of the heir-apparent to the imperial throne. Derivations of this title were used until modern times by the rulers of Germany, Imperial Russia, and Bulgaria, and also by the Brit. monarch as Emperor of India (Kaisar-i-Hind).

Caesar, Sir Charles (1590-1642), judge, third son of Sir Julius C. (q.v.), was

educ. at Magdalen College, Oxford; fellow of All Souls, 1605; entered the Inner Temple in 1611. He paid James I. £15,000 for the mastership of the rolls in 1639.

Caesar, Gaius Julius (102-44 BC), Rom. statesman and one of the world's greatest military commanders. He was descended from a patrician family which had long been attached to the senatorial clique; but from the earliest years of his public life he sided with the popular party. This was due to the influence of G. Marius (q.v.), who was his uncle by marriage and had created him priest of Jupiter in 86.



British Museum

GAIVS JULIVS CAESAR

In 83 C. incurred the wrath of Sulla (q.v.) by his own marriage with Cornelia, daughter of L. Cornelius Cinna (q.v.), and he was proscribed. His aristocratic relatives and the college of vestal virgins persuaded the dictator to spare his life; but he deemed it prudent to leave Italy for the time being. In 81, therefore, he left for Asia, and for the next 3 years served with distinction in the Rom. army. Following Sulla's death in 78 C. returned to Rome and showed his democratic sympathies by prosecuting Gn. Dolabella for extortion in the prov. of Macedonia. The prosecution failed, and C. once more withdrew from Italy. He studied rhetoric under Molon at Rhodes and played a useful part in the opening stages of the third Mithradatic war. Returning to Rome in 74 or 73, he found that he had been elected to a place in the college of pontiffs. His ambition had no doubt already been awakened; but the time was not yet ripe for political advancement, and he embarked on a brief career of gaiety out of all proportion with his private means. In 68 he was quaestor in

Hither Spain; aedile in 65, when he added still further to his enormous debts by lavish expenditure on public entertainments and buildings; and in 63 he was chosen *pontifex maximus*. Meanwhile Cornelia had d., and C. had married Pompeia, daughter of Q. Pompeius Rufus (67). He had also exhibited his goodwill towards Pompey (q.v.) by supporting the Gabinian and Manilian laws. After serving as praetor in 62 he went in the following year as pro-praetor to farther Spain, thereby enabling himself to reduce his debts, and to win a considerable military reputation by victories over the Lusitanians. In 59 he was consul and formed the first triumvirate with Pompey and Crassus. As consul C. put through an agrarian law, won the favour of the equites by certain financial measures, and secured the ratification of Pompey's E. settlement. In return, the people voted him the gov. of Illyricum and Cisalpine Gaul for a period of 5 years, to which the Senate were obliged by popular opinion to add Transalpine Gaul. It was about this time also that C. divorced Pompeia on account of a supposed liaison with Clodius (q.v.), and married his third wife, Calpurnia, who survived him. The years 58-50 were spent mostly in Transalpine Gaul, which he subdued by a series of brilliant campaigns. A new arrangement with Pompey and Crassus (55) gave C. an extension of his command for another 5 years to 30 Dec. 49. But Pompey's jealousy had been aroused; the death of his wife Julia (C.'s daughter) in 54 dissolved one of the few remaining bonds between the 2 leaders, and the death of Crassus at Carrhae in 53 left them without a mediator. Towards the end of 52 Pompey, after being sole consul for that year, was granted the governorship of Spain for 5 years, which he proceeded, against all constitutional practice, to exercise by deputy since he dared not leave Rome. C. asked for election to the consulate for 49 notwithstanding his absence from the capital; the Senate refused, the quarrel with Pompey had reached its limit, and C. crossed the Rubicon early in the new year, thereby precipitating civil war. He drove the Pompeian forces from Italy to Greece; hurried to Spain, where he defeated Afranius and Petrelus in a bitterly fought campaign. Returning to Rome, where he had been appointed dictator, C. was elected consul for 48, and then crossed to Greece. After being worsted by Pompey before Dyrrhachium, he routed him at the great battle of Pharsalus (9 Aug. 48). Pompey fled to Egypt, but was murdered before C.'s arrival there.

No sooner had C. reached Alexandria than he became embroiled in a war with the ministers of Ptolemy XIII. This was terminated in Mar. 47; whereupon C. marched through Syria and Asia Minor, defeating Pompey's ally Pharnaces at Zela. He returned to Rome in Sept., but before the end of that month he was called to meet a new threat in Africa. There, on 6 April 46 he defeated the senatorial commanders Scipio and Cato

at Thapsus. Back again in Rome, as undisputed master of the Rom. world, C. was appointed dictator for 10 years. The crowning victory, however, had yet to be achieved. Pompey's 2 sons, Gnaeus and Sextus, determined to make a last stand in Spain. C. annihilated their forces at Munda on 17 Mar. 45. But jealousy reared its head in the hour of triumph. On 15 Feb. 44, at the festival of Lupercalia, Mark Antony (q.v.) offered C. a crown. It was refused; but on the Ides of March following Cassius (q.v.) and his fellow conspirators struck, and C. lay dead at the foot of Pompey's statue in the senate house.

C. has been bitterly attacked as a man of overweening ambition. It should, however, be borne in mind that since the beginning of his political career, and long before, the republican gov. had been hopelessly inadequate and utterly corrupt. The legislative measures proposed by C. in the short time at his disposal may not conform to our picture of an ideal state, but they do not suggest inhuman tyranny. No political reputation could have come unsullied through the bog that was republican Rome in the 1st cent. bc. No doubt whatsoever attaches to C.'s transcendent genius as a soldier.

In private life C. manifested those gifts which belong to a cultured gentleman. The aspersions cast by Catullus and others against his moral character would not to-day bear the scrutiny of the most servile bench of magistrates.

As an author C. was ranked by his contemporaries in the highest class. We possess no example of his celebrated eloquence; but the purity of his style, no less than his military genius are enshrined in the Commentaries, *De Bello Gallico* and *De Bello Civili*, of which there is a complete trans. (J. Warrington) in Everyman's Library. See J. A. Froude, *Caesar*, 1879, and T. Rice Holmes, *The Roman Republic and the Founder of this Empire*, 1923.

Caesar, Sir Julius (1558-1636), lawyer, noted for his great generosity, was the son of Cesare Adelmare, physician to Queen Mary, and a descendant of the It. dukes de' Cesarini. C.'s father migrated to England, about 1550, and began practice in London as a physician. He obtained letters of naturalisation from Queen Mary with immunity from taxation in 1558. On one occasion he received the magnificent fee of £100 from her for a single attendance. Queen Elizabeth also consulted him and rewarded him with leases of eccles. lands at low rents. The son, who was b. Tottenham, was educ. at Magdalen Hall, Oxford, and took degrees both there and in Paris. He was called to the Bar in 1580; became judge of the admiralty court, 1584; chancellor of the exchequer, 1606; master of the rolls, 1614. He was a friend of Whitgift and of Bacon, and had a high reputation for integrity. He wrote a treatise on the Privy Council, and with Lord Keeper Coventry drew up ordinances of procedure intended to correct abuses which had grown up in the court of chancery.

Caesar-Augusta, see ZARAGOZA.

Caesarea: 1. Anct name of Kāsarīeh, a coast vil. and fishing port of Israel, 28 m. from Tel Aviv. Founded by Herod the Great, a very important city often mentioned in the Bible. After AD 70 it was the cap. of Rom. Palestine and residence of the procurators, and the eccles. cap. until AD 451. St Paul was a prisoner in C. for 2 years. The tn was taken by the crusaders under Baldwin I in 1101, when the booty included the green crystal vase supposed to have been used at the Last Supper and, later, celebrated in medieval legend as the Holy Grail. C. was destroyed by Bibars in 1265. Very little remains to-day of the anct city. The ruins are surrounded by a low, grey stone wall. Coasting vessels often put in, as water is good and abundant.

2. C. Philippi, now Bānlās (Panaas), vil. of Syria, near R. Jordan below Mt Hermon, 45 m. from Damascus. Founded by Philip the Tetrarch, 3 BC, it was prominent in time of the Crusades.

3. Anct name of Cherchel, a seaport tn of Algeria, 55 m. from Algiers. Ruins are still left. The port is shallow and exposed to N. winds. Near by are large marble quarries, and mines of silver, iron, and lignite. Pop. about 4000 (com. 8000).

Caesarean Section, operative delivery of the foetus from the uterus by incision through the abdomen and uterus. Modern practice is to make the incision through the lower segment of the uterus (q.v.) and this avoids to a large extent the danger of the uterus rupturing at the site of the scar in any subsequent pregnancy. Sepsis used to be a feared complication of C. S., but with the aid of chemotherapy this is now rare. The availability of transfusion has also added to the safety of the operation. Julius Caesar is believed to have been delivered by this method, hence the name. See OBSTETRICS.

Caesarion (47-30 BC), son of Cleopatra, who declared that Julius Caesar was his father. Though this has been denied, it is said that Antony once told the senate that Caesar had acknowledged the relationship. In 34 BC he received from Antony the title of king of kings, but 4 years later he was put to death by order of Augustus.

Caesena, see CEFENA.

Caesium, metallic chemical element usually associated with rubidium. It was the first metal discovered by spectrum analysis, in the mineral spring at Dürkheim and, later, in those of Frankhausen and Wheal. It occurs in the rare mineral pollucite, a hydrated C. aluminium silicate; in minute amount in a number of continental mineral springs; and in carnallite (hydrated chloride of potassium and magnesium). It is a silvery white metal, inflames in air when heated, melts at 26°, boils at 670°, has a sp. gr. of 1.85, and is poisonous to vegetable life. Chemical symbol Cs; atomic weight 132.8; atomic number 55.

Caesura (Lat., 'cutting'), point at which a line of verse divides naturally into 2

parts, involving a metrical rest or stop. It comes between 2 words and commonly about the middle of the line, but need not coincide with any pause in grammar or sense. The term is taken from the classics: in Gk and Lat. hexameters there is a C. usually either in the 3rd foot (penthemimeral C.) or in the 4th (hephthemimeral C.). In Eng. heroic verse it occurs most commonly after the 4th or 6th syllable. A line may have more than 1 C., and lines shorter than the deca-syllable may have none. The C. is especially noticeable in long lines such as Tennyson's 'All the charm of all the Muses / often flowering in a lonely word.' See W. R. Hardie, *Res Metrica*, 1920.

Cafaggiolo, see BARBERINO DI MUGELLO.**Café, see COFFEE HOUSES.****Caffa, see KAFFA.**

Caffeine (C₈H₁₀N₄O₂) is a vegetable alkaloid of the xanthine group. Its chemical name is 1 : 3 : 7 trimethylxanthine, and it has been synthesised in the laboratory. Its occurrence in beverages in common use makes its study important. Thus it is the same as theine, which exists in tea-leaves to the extent of 3.2 per cent, in coffee 1.5 per cent, in Paraguay tea or maté, and beverages concocted from the kola nut. It may be procured from a strong infusion of tea in the following manner: The tannin is precipitated by means of lead acetate, the excess of which is precipitated by passing through it hydrogen sulphide. On filtration the liquid is evaporated down and neutralised with caustic potash, when on cooling the C. will crystallise out. The crystals are colourless, long, and silky, with one molecule of water of crystallisation. They are only slightly soluble in cold water, but easily soluble in hot water or alcohol and in chloroform. The salts are decomposed by water, but the citrate, produced by adding C. to a hot solution of citric acid and evaporating, is widely used, having the same properties as C. C. is a product of xanthine, and they are both products in the breaking down of the nucleo-proteins of the plants, the final product being uric acid. In the human body uric acid is not produced by C., so that there is no danger to be feared from it by people with gouty dispositions. C. is primarily a stimulant. It stimulates the reasoning powers as well as others and prevents sleep. Unlike alcohol, its action is not followed by a sedative effect, and hence it may be termed a true stimulant. In medicine it is used as a heart stimulant, also as a diuretic. **Caffeic acid** is obtained by boiling with caustic potash caffeotannic acid, which occurs to the extent of 4 per cent in coffee berries. It crystallises in yellow monoclinic crystals, and has the formula C₈H₆(OH)₂CH = CH·COOH.

Caffraria; Caffres, see KAFFIRS and KAFFRARIA.**Caffristan, see KAFFRISTAN.**

Caffyn, Matthew (1628-1714), Arminian Baptist minister. He was expelled from Oxford Univ. for his beliefs, and became minister at his native place, Horsham, in Sussex, where he was 5 times imprisoned for unlicensed preaching. His *Arian*

doctrines led to a split in the Baptist Church (1701). But the 2 dissident parties came together again in 1704. There was the first deliberate endorsement of latitudinarian opinions in the article of the Trinity by the collective authority of any tolerated section of Eng. dissent. C.'s works are very rare. They include *Envy's Bitterness corrected* (c. 1674), *A Raging Wave foaming out of its Own Shame*, 1675, *The Great Error and Mistake of the Quakers* (no date), *Baptist's Lamentation* (no date), and numerous polemical tracts. See T. Crosby, *History of English Baptists*, 1740.

Cafila, or **Cafila**, term used for a company of travellers or a caravan in Arabia, Persia, and N. Africa.

Caftan (Turkish *qafan*), national dress of the Turks. It is usually made of woollen or silk material, and is white in colour, with a yellow flowering design. C.s were frequently used as gifts, by the Turkish court, to Christian ambas, who in the 18th cent. were required to wear them on ceremonial occasions in the presence of the Sultan or the Grand Vizir.

Caḡayan, large prov. at the extreme N. of the is. of Luzon, in the Malay Archipelago. It is extremely fertile, and rice (the staple food) and tobacco are the chief crops. C. is also the name of the largest riv. of the is. Area 3470 sq. m.; pop. 311,088. C. is also the name of a tn in Mindanao Is. Pop. 46,266.

Cage-birds. From earliest times birds that are notable for their plumage, their song, or their interesting ways have been kept in confinement as pets. The favourites among the songsters are the nightingale, blackcap, thrush, blackbird, skylark, woodlark, and starling; while the linnet, goldfinch, bullfinch, siskin, and canary are also popular. The last-named is one of the commonest C. in this country, and, though really a foreign bird, has become thoroughly acclimatised. Siskins and redpolls, and also linnets and goldfinches, have been made to draw their water and food in miniature buckets from wells beneath their bucket-board. It is, unfortunately, also the case that birds have had their eyes 'bleared' with a hot iron to make them sing better. Of other Brit. birds, the common jay and the jackdaw are often kept as C. for the sake of their entertaining ways and their powers of mimicry. Foreign C. are more sought after for their plumage than for their song, though the canary, shama, Amer. mockingbird, Virginian nightingale, Peking nightingale, bulbul, and bluebird are all good songsters. The Australian budgerigar (q.v.) is also popular. Parrots are much in request as C., and parakeets and cockatoos are also kept, though the latter are somewhat noisy for the house. Of the parrots, the yellow-faced Amazon is the best talker. The greys from S. and W. Africa are not acclimatised at all easily; of the 2 species, that from W. Africa is the harder. Care has to be taken in the feeding of C. The soft-billed songsters, such as the thrush and the lark, should be fed on crushed hemp, bread-crumbs, and

insects, and a spider is one of the best of tonics for them. The nightingale requires special attention, being difficult to feed and rear properly. Some birds, such as the finches, linnets, and canaries, eat mostly grain, while others, such as starlings, redbreasts, and wrens, feed mostly on insects or berries. Canary seed and rape seed are chiefly used for the grain-eating birds, and canary seed is the best food for all species of parrots. The ailments of C. are mostly due to excessive or otherwise improper feeding, combined with their lack of exercise in confinement. The most universal remedy is a drop of castor oil, administered with a quill or a camel-hair brush. Birds are more sensitive to draughts than human beings, and should never be placed in a window for that reason. Nor should they be kept in conservatories, or other places where the temp. is variable. Birds kept under bad conditions in this respect are always in bad health, and pulmonary troubles sometimes result. Epilepsy, due to overfeeding, constipation, and diarrhoea may occur when the birds are moulting. A rusty nail in the drinking water is a good thing at such times, and stimulating food should be given. See W. A. Blakston, W. Swainsland, and A. F. Wiener, *Illustrated Book of Canaries and Cage-birds, British and Foreign*; C. Rogers, *Budgerigars and How to Keep Them*, 1936; L. P. Luke and A. Silver, *Aviaries, Bird-Rooms, and Cages*, 1939; C. St John, *Canary Breeding for Beginners*, 1947.

Cages have frequently been used in the past for the imprisonment of human victims. The philosopher Callisthenes was kept in an iron cage for 7 months by Alexander the Great for refusing to pay him divine honours. Catherine II of Russia imprisoned her wig-dresser for 3 years in an iron cage lest people should know that she wore a wig. Edward I confined the Countess of Buchan and a sister of Robert Bruce in a similar way. The former, whose offence was placing the crown of Scotland on the head of Bruce, was placed in an iron cage on one of the towers of Berwick Castle. Similarly, Tamerlane made a public show of the Ottoman sultan, Bayazid I. Louis XI confined Cardinal Balue, grand-almoner of France, in an iron cage in the castle of Loches for 11 years. The bodies of the Anabaptist leaders, John of Leyden, Knipperdolling, and Krockting, were exposed in iron C.s at Münster, Westphalia, in 1536.

Cagliari, or **Callari**, Paolo, see VERONESE. **Cagliari**: 1. Prov. of Italy, in S. Sardinia (q.v.). It has coastlines on the W., S., and E., and is generally mountainous. The prov. is crossed NW.-SE. by a broad plain, watered by the Mannu and its tribs. and the Tirso and its tribs. At the NW. end of the plain there are sev. lakes. Area 3585 sq. m.; pop. 710,000.

2. (Anct Carales), it. city, cap. of the prov. of C., and chief tn of Sardinia. It is on the S. coast of the is., at the head of a broad inlet of the Mediterranean called the Gulf of C. The city is built at the

base and on the slopes of a hill, and has salt lagoons on either side. By origin probably a tn of the Phoenicians (see PHOENICIA), C. became prosperous under Carthage and Rome (qq.v.). It was taken successively by the Vandals (AD 485), the Byzantines (533), the Saracens (12th cent.), Pisa, Aragon (1326-1714), and Austria (qq.v.), and eventually went to the House of Savoy (q.v.). There was severe damage in air-raids during the Second World War; in a daylight raid on the It. base at C. by 100 Flying Fortresses on 31 Mar. 1943, more than 25 ships in the harbour and many planes at 3 adjacent airfields were destroyed or damaged. C. has an archiepiscopal cathedral (13th-17th cents.), a univ. (1606), a botanical garden, and an archaeological museum. There are remains of medieval fortifications, and Rom. remains, including a Punico-Rom. necropolis. There is a fine and busy harbour; the chief exports are zinc, lead, and salt. There is also a fishing industry. Pop. 171,600.

Cagliostro, Alexander, Count (1743-1795). It. impostor, b. Palermo. His real name was Giuseppe Balsamo. He was educ. at the monastery of Caltagirone, where he acquired a smattering of chem. and medicine. His conduct led to his expulsion, and later he travelled considerably, visiting, it is believed, Greece, Egypt, Arabia, Persia, Rhodes, and Rome. In Rome he met and married a beautiful girl, Lorenza Feliciani, who proved a willing confederate in her husband's trickeries. In Rhodes C. had studied alchemy under the Gk Althotas. Later he travelled through Italy and Germany, posing alternately as necromancer, physician, and freemason. At Strasbourg he grew rich with the profits of his 'elixir of immortal youth.' The count would solemnly declare he was a cent. and a half old, and his wife, who was only 20, would refer to an imaginary son who was a veteran Dutch naval officer. They made a fortune from the gullibility of the fashionable society of the day; but C.'s quackeries were one by one exposed. The Scottish physician to Catherine, at St Petersburg, pronounced his celebrated 'spagiric food' unfit for dogs: in Paris he was deeply involved in the affair of the diamond necklace (1785) and thrown into the Bastille; on his liberation he went to England, where lawyers succeeded in confining him in the Fleet. Finally, after further degradations and compulsory wanderings, this 'bull-necked forger' underwent a sentence of perpetual imprisonment at Rome for freemasonry. He d. in the fortress prison of San Leone, whilst his wife found refuge in a convent. An excellent account of this prince of charlatans will be found in Carlyle's *Miscellanies*. See also W. R. H. Trowbridge, *Cagliostro: the Splendour and Misery of a Master of Magic*, 1910.

Cagots, name of a distinct and formerly outcast people living in the Basque provs. of the W. Pyrenees. The name is also applied to similar peoples in Béarn, Gascony, and Brittany. The origin of the C. is uncertain. Various traditions claim

that they are descended from the heretic Visigoths, who remained in France after their defeat by Clovis in the 5th cent. Another tradition gives them descent from the Saracens conquered by Charles Martel. It is now more generally considered that they were originally ostracised on account of their leprosy, which they have long since thrown off. There is no evidence to show that they ever used a separate language. At the time of the Fr. Revolution they were given equal rights as citizens, and they have since become more or less merged in the general peasantry.

Cahan, Charles Hazlitt (1861-1944), Canadian statesman, journalist, and lawyer, b. Nova Scotia, and graduated at Dalhousie Univ. He was elected in 1890 as a member of the Nova Scotia Legislature, and was soon made leader of the Conservative party. Moving to Montreal, he became one of the leading lawyers in the dominion. When R. B. Bennett (q.v.) became Prime Minister in 1930, he made C. secretary of state in his Cabinet. Cahir, tn with trade in corn and flour, co. Tipperary, Rep. of Ireland, 11 m. W. of Clonmel, beautifully situated on the R. Suir, at the foot of the Galtee Mts. C. Castle (15th cent) is the largest of its kind in Ireland, and stands on a rocky is. in the riv. Pop. 1900.

Cahiriveen, tn in co. Kerry, Rep. of Ireland, of great scenic and antiquarian interest. Ballycarberry Castle and Leacanabuaile Fort (excavated 1940) are near by. Carhan near C. was the bp. of the 'liberator' Daniel O'Connell (q.v.). Pop. 1687.

Cahors (anc. Divona), Fr. tn, cap. of the dept. of Lot, on the Lot. It is the seat of a bishopric, and was the cap. of Quercy (q.v.). There are Rom. remains, and many remarkable buildings, including a 12th-cent. cathedral, a 14th-cent. 3-towered, fortified bridge, and the 14th-cent. castle of the seneschal of Quercy. Pope John XXII and Gambetta (q.v.) were b. in C. It manufs. leather and pottery, and has a trade in wine, wool, and nuts. Pop. 15,300.

Caiazzo, It. tn, in Campania (q.v.). 7 m. N. of Caserta (q.v.). It has Rom. remains. Pop. 6000.

Calbarien, or Puerto de Calbarien, tn and seaport situated on the N. coast of Cuba, Las Villas prov., 3 m. from Remedios. It possesses a good harbour, and railway communication with Espiritu Santo and Remedios. It processes and exports products of the surrounding agric. dist. Sponge-fishing is done. Pop. 31,380.

Calicos Islands, see **TURKS AND CAICOS**.

Calets, see **GAETA**.

Caillaux, Joseph Pierre Marie Auguste (1863-1944). Fr. politician, b. Le Mans, was educ. for the law; became inspector of finances in 1888, and in 1892 prof. in the Ecole des Sciences Politiques. He was elected deputy for Sarthe in 1898, in 1902, and in 1906—when he became vice-president of the Chamber. C. was minister of finance under Waldeck-Rousseau, 1899-1902; Clemenceau, 1906-8; Monis, 1911. He was Prime Minister, 1911-12. In 1913

he again became finance minister, in the Doumergue Cabinet. When his wife murdered the editor of *Figaro*, Gaston Calmette (q.v.), C. resigned, and defended her. She was acquitted. During the First World War he was at first paymaster-general of the forces. Suspected of defeatism, he was arrested, Jan. 1918, but not put on trial until Feb. 1920. Although the case against him collapsed, he was condemned to 3 years' imprisonment and to 10 years' loss of civic rights and other disabilities, but he was released next day, and in 1924 received the benefit of the general amnesty. He was for a little while minister of finance under Poincaré in 1925; and again in 1926 he held that office for a few weeks. Two years later he brought about the fall of the Poincaré Gov. President of finance committee of Senate, 1932. He last held office as minister of finance in 1935, in Bouisson's short-lived gov. He remained chairman of the finance committee of the Senate until the collapse of France in 1940. C. was a politician of continental repute, but his arrogance made him many enemies. He was an expert in taxation, and effected reforms in many spheres of Fr. financial administration. His pub. include his *Mémoires*, 1942-7.

Caillé, or Caillié, René Auguste (1799-1839), Fr. traveller, b. Mauzé in Poitou, the son of a baker. Having gone to Senegal while still a youth, he learned in 1826 that the Paris Geographical Society had offered 10,000 francs to the first traveller who should reach Timbuktu. Attired in Moorish dress, he set out from Kakondy in Sierra Leone on 18 April 1827, and reached Timbuktu on 20 April 1828, proceeding thence across the Sahara to Tangier, which he reached only after great privations. He received the 10,000 francs, and also the order of the Legion of Honour and a pension. He pub. an account of the journey, ed. by E. F. Jomard. He d. at Badere of a disease contracted during his travels. See also F. Dubois, *Tombouctou la mystérieuse*, 1887.

Cailliaud, Frédéric (1787-1869), Fr. explorer in Egypt and Nubia, b. Nantes. A goldsmith by trade, he was led to examine the mineral resources of Egypt, and, in so doing, located the site of the ant. emerald mines of Jebel Zabara. He made important discoveries in Siwah, his report thereon leading to its annexation by Egypt in 1820, and he also made a notable journey of discovery to the White Nile, in company with Ibrahim Pasha's expedition, and pub. the results in his *Voyage à Meroé au fleuve Blanc*, 1826.

Caïman, or Cayman, name given to sev. species of alligator found in Central and S. America. The C. differs in some points from the alligator of China and also of N. America, but only in minor details. Except for one Chinese species, the alligator is peculiar to America.

Cain, first-born of Adam and Eve, and first murderer. He slew his brother Abel because Abel's sacrifice was accepted and his was not. Banished for this deed, he

went to live in the land of Nod. A protective mark was, however, put on him and a curse was pronounced on anyone who should kill him. Tradition says he was slain accidentally. The Ophite Gnostics (AD 130) were called Cainites, as they held peculiar views of the significance of C. and Abel (Gen. iv).

Caine, Sir Thomas Henry Hall (1853-1931), novelist, b. Runcorn, Cheshire, of Manx and Cumberland parentage. He was educ. in the Isle of Man and at Liverpool. After studying as an architect, he became leader writer on the *Liverpool Mercury*, and gradually took up literary work. He went to London on the invitation of D. G. Rossetti, and wrote for the *Athenaeum*, the *Academy*, and other periodicals. After publishing *Recollections of Rossetti*, 1882, *Sonnets of Three Centuries*, 1882, and *Cobwebs of Criticism*, 1883, he began a successful career as a novelist with *The Shadow of a Crime*, 1885. His subsequent novels included *A Son of Hagar*, 1887, *The Deemster*, 1887, *The Bondman*, 1890, *The Scapegoat*, 1891, *Captain Davy's Honeymoon*, 1892, *The Manxman*, 1894, *The Christian*, 1897, *The Eternal City*, 1901, *The Prodigal Son*, 1904, *The White Prophet*, 1909, *The Woman Thou Gavest Me*, 1913, *The Master of Man*, 1921, and *The Woman of Knockaloe*, 1923. He ed. *King Albert's Book*, 1914-1915; in 1928 issued an enlarged version of his *Recollections of Rossetti*. His *Life of Christ* was pub. after his death, in 1938. *The Deemster* was made into a play as *Ben-my-Chree* in 1889, and sev. others of his novels were dramatised. In 1895 he went to Canada for the Society of Authors and the Colonial Office to negotiate terms of copyright. He was elected to the Manx House of Keys in 1901, and was made a K.B.E. in 1918 and a C.H. in 1922. He d. at Greeba Castle, Isle of Man, leaving a fortune of £250,000. See C. F. Koryon, *Hall Caine: the Man and the Novelist*, 1903, and S. Norris, *Two Men of Manxland*, 1947.

Ca'ing Whale (*Globiocephala melaena*), cetacean of the dolphin family, is variously known as the Pilot-whale, the Black Fish, or the Social Whale. It grows to about 28 ft. The name 'ca'ing' is derived from a Scottish word, *ca*, to drive. These whales, which feed chiefly on cuttle-fish, are mild in disposition, and are not only very gregarious, but are also more often stranded than any other species. Except for a white streak on the lower parts from behind the chin to the middle of the belly the C. W.s are black; their skin is quite smooth. The fore limbs, which are about 5 ft long, join the body very low down. The front of the skull is nose-shaped, and above and below the blow-hole are some dozen small conical teeth. In front of the blow-hole is a lump of fat. Generally speaking, the head is flat and broad. This genus of whale is found in almost every sea.

Cainozoic Period, see TERTIARY.

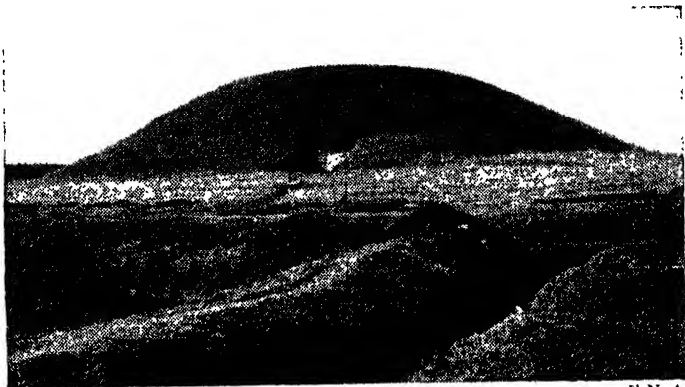
Caird, Edward (1835-1908), theologian and philosopher, brother of John C., b. Greenock, and educ. at Glasgow Univ.

and Balliol College, Oxford. After a brilliant record at the latter univ., he was, from 1864 to 1866, fellow and tutor of Merton College. In 1866 he returned to Glasgow and became prof. of moral philosophy, and in 1893, he became master of Balliol. In 1892 he had received the honorary degree of D.C.L. Through his pupils he has exercised a great influence on Eng. philosophy, and may be considered to have founded a school of neo-Hegelianism. His works include *A Critical Account of the Philosophy of Kant*, 1877, *The Social Philosophy and Religion of Comte*, 1885, *Essays on Literature and Philosophy*, 1892, *The*

C., however, is only part of the monument, its outward appearance above ground, and the use of the term without proper qualification is misleading.

Cairn Terrier, small, short-legged breed of dog, sandy-grey or brindle in colour, some being almost black. The C. T. has a foxy head and small pointed ears. It is a good sporting as well as a good house dog. The name is due to the fact that these dogs were employed for driving foxes out of cairns.

Cairnes, John Elliot (1823-75), Irish political economist, began life in his father's brewery, but proceeded to Trinity College, Dublin, and graduated in 1848.



E.N.A.

THE STONE AGE CAIRN OF MAES HOWE, ORKNEY

This huge mound with its dry-stone masonry chambers, once the tomb of a prehistoric chieftain, was looted by Vikings.

Evolution of Religion, 1893, *The Evolution of Theology in the Greek Philosophers*, 1904.

Caird, John (1820-98), brother of Edward C., b. Greenock, minister of the Church of Scotland, 1845. He preached a notable sermon before the queen at Crathie in 1855, afterwards pub. under the title *The Religion of Common Life*. In 1862 he was appointed prof. of theology at Glasgow Univ., becoming vice-chancellor and principal in 1873. He delivered the Gifford lectures in 1892-3 and 1895-6, ed. and pub. in 1900 as *The Fundamental Ideas of Christianity*. His other works include *Sermons*, 1858, *Introduction to the Philosophy of Religion*, 1880, and *Spinoza*, 1888.

Cairn, or **Carn**, Celtic word meaning a heap of stones, and in archaeology describing a burial mound (see **BARROW**). It made entirely or partly of stones. It follows that C.s are found only in country with a stony sub-soil. Long C.s are of the Neolithic, while round C.s belong to the Bronze Age. In Yorks, C. cemeteries were a feature of the Early Iron Age.

He was called to the Irish Bar, but turned his attention to social and economic questions, and in 1856 became Whately prof. of political economy at Dublin. Three years later he became prof. of political economy and jurisprudence at Queen's College, Galway, and in 1866 he succeeded to the chair of political economy at Univ. College, London. He belonged to the same school of thought as John Stuart Mill. His works include *The Slave Power*, 1862, *Political Essays*, 1873, and *Some Leading Principles of Political Economy newly Expounded*, 1874.

Cairngorm Stone (**Cairngorm**) (Gaelic *carn*, heap; *gorm*, blue), name of yellow and brown varieties of quartz, called after the Cairngorm mts (Granitians) in Banff-shire, where it was found originally. This mineral occurs in crystals lining the cavities in highly inclined veins of a fine-grained granite running through the coarser granite of the main mass. The stone is a special favourite in Scotland (sometimes called Scotch topaz), and is used for various ornamental purposes, e.g. set in the lids of snuff-mills, in the

handles of dirks, in brooches for Highland costume, in pins and bracelets. Its value depends on transparency and colour.

Cairngorms, group of granite mts in Scotland, forming a N. branch of the Grampians. They occupy an area some 20 m. from E. to W. by 15 m. from S. to N. in Banffshire, Inverness-shire, and Aberdeenshire, between the upper Spey and the Dee. It is the biggest group of high hills in Britain. The 6 main summits are Ben Macdui, 4296 ft (the second highest summit in the country), Braeriach, 4248 ft, Cairn Toul, 4241 ft, Cairngorm (the blue mt), 4084 ft, which has given its name both to the group and to the brown, blue, and yellow quartz crystals which are found throughout the range, Ben Avon, 3843 ft, and Beinn a' Bhuid, 3924 ft. The C.s embrace a wealth of hill, river, forest, and loch scenery unsurpassed in Scotland. Great herds of red deer roam the hills. The winter snowfall is heavy, and winds higher than those normally encountered on the world's great ranges. Rock-climbing, snow-climbing and skiing, deer-stalking, grouse-shooting, and angling are the sports most widely practised. In 1954 the Nature Conservancy declared the central C. a nature reserve, but access for walkers and mountaineers and proprietors' normal sporting rights are not affected.

Cairns, Hugh MacCalmont, 1st Earl (1819-85), Brit. statesman, educ. Belfast and at Trinity College, Dublin, and called to the Eng. Bar, 1844. C. became M.P. for Belfast, 1852; solicitor-general under Lord Derby, 1858; attorney-general, 1866. He was created Viscount Garmoyne and Earl C., 1878. C. was lord chancellor in the Disraeli ministry, 1868. One of the finest parl. orators of his time, his best-remembered speech being the 'Peace with Dishonour,' after Majuba.

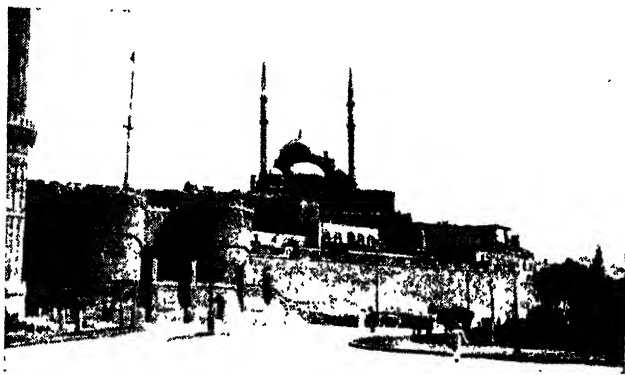
Cairns, John (1818-92), Presbyterian minister, b. Ayrton, Berwickshire. He studied at Edinburgh (1834-41) and Berlin Univs. (1843-4), and at the Presbyterian Secession Hall from 1840. Minister of the United Presbyterian church, Berwick-on-Tweed, 1845-76; prof. of apologetics in the United Presbyterian Theological Hall, Edinburgh, 1867; principal of the Theological College, Edinburgh, 1879. C. was an excellent linguist, and travelled widely on the Continent at different times. Among his works are *Liberty of the Christian Church and Oxford Rationalism*, 1861, *False Christs and the True* (criticism of Strauss and Renan), 1864, *Outlines of Apologetical Theology*, 1867, *The Doctrine of the Presbyterian Church*, 1876, and *Christ the Morning Star, and other Sermons*, 1893. See D. Maasson, *Recent British Philosophy*, 1875, and A. R. MacEwen, *The Life and Letters of John Cairns*, 1895.

Cairns, municipality and seaport of Queensland, Australia, on Trinity Bay, 1043 m. N. of Brisbane. It is the port for the sugar produced on the coast as well as for the exported wealth of the Atherton Tableland. Pop. 21,400.

Cairo is the cap. of modern Egypt and the most populous of African cities. Situated on the Nile, 12 m. S. of the head of the delta, and 80 m. W. of Suez by rail, it extends over an area of some 10 sq. m. Whilst the SE. portion, including the citadel, rises on the rocks of the Mokattam Hills, the greater part of the city is built over the alluvial plain in the riv. valley. C., the fourth Muslim cap., was founded in AD 968 by Jauhar el-Kaid, who called it El-Kahira ('the victorious'), a name which was gradually corrupted into C. The ruins of the first cap., Masr, estab. in AD 641, together with some towers of the Rom. fortress at Babylon, a colony founded in 525 BC, may still be seen at Masr-el-Atika, or old C., which lies a mile to the S. of the modern tn. Shortly after AD 1176 Saladin erected the citadel and a portion of the city walls. Under the dynasty of the Mameluke sultans the cap. prospered, and the tn of Bulak was founded, which is now the flourishing port (and suburb) of C., and which lies at its NE. extremity. Sultan Selim overthrew their sovereignty in 1517, and from this date until 1798, when the city passed by conquest into the hands of the French, C. was the conservative metropolis of Turkish Egypt. Three years later it was wrested from these conquerors by the English and Turkish forces combined, and once more was obliged to submit to Ottoman rule. In 1811 Mehemet Ali, the Turkish viceroy, by his massacre of the Mamelukes, acquired a mastery over the city, which became the cap. of an independent kingdom. During his reign, and still more under Ismail Pasha, who ruled from 1863, rapid changes took place; fresh quarters were designed and new thoroughfares opened out, and following the Brit. occupation in 1882 improvements multiplied. It is to this occupation that C. owes its excellent water supply and drainage system. Formerly the death-rate was abnormally high owing to the prevalent insanitary conditions. During the First World War, C. became the administrative H.Q. of the allied campaigns in Egypt and Palestine. In 1919 serious anti-Brit. outbreaks occurred in the city, and the military was forced to intervene to restore order. Serious outbreaks occurred again in 1930. During the Second World War C. was the Middle E. G.H.Q. In the 6 months prior to the Brit. evacuation of the Citadel (July 1948) 20,000 Brit. troops were moved from C. to Alexandria (see below). A N. wind and the Nile floods help to moderate the summer heat: the mean temp. for the year is 68°. After the ann. inundation has subsided, damp exhalations from the riv. keep the surrounding country moist during the late autumn months, even though hardly any rain falls. Speaking generally, the only commercial importance of C. is as a depot for the transit of goods of every variety from the Sudan, Upper Egypt, India, Persia, Asiatic Turkey, and also for many European manufs. It has become a manufacturing centre since the Second World War. The modern city is the fourth founded in succession on the

same site, and remains of the former cities are included in it: old walls and gateways, narrow streets and latticed houses, together with many mosques. Place Atabet, to the SE. of the Esbekiya gardens, is the central point for the electric tramways. The fine boulevard Mohammed Ali runs SE. as far as the citadel, whilst on the SW. the *sharia* Kasr-en-Nil leads down to the Great Nile bridge, which connects the is. Gezira Bulak with the mainland. To the N. of the bridge are the large Kasren-Nil barracks and the splendid museum of Egyptian antiquities, erected in 1902. Originally founded at Bulak by Mariette, it contains the finest collection in the world of Pharaonic relics. The

estab. in 971, is the great centre of Muslim intellectual life. C. is a city of many churches, Coptic, Greek, Maronite, Armenian, Syrian, and Rom. Catholic, besides some 400 mosques, many of which are of magnificent architecture. Among the most beautiful are the mosques of Tulun, Kalaun, Barbuk, Kâit-Bey, and especially that of Sultan Hasan (1358). The 3 gates of the city, Bab-en-Naas, Bab-el-Futuh, and Bab-Zuweyleh, are splendid examples of the massive yet simple effects which the Mohammedan architects knew so well how to produce with the fine ashlar masonry. Beyond the E. wall of the city lie the so-called tombs of the caliphs. They are really the mausoleums of the Mamchukes,



Canadian Pacific

CAIRO: THE CITADEL

national library and Arab museum, opened in 1903, lie off the boulevard Mohammed Ali. The former contains some 100,000 vols., the majority being of E. literature, and is quite unique, whilst the latter encourages the preservation of the monuments of Arabic art, which were for cents. neglected. C.'s earliest Arab building is the mosque of 'Amr, dating from AD 643. From Place Atabet the Muski runs straight into the oriental city, which lies to the E., whilst the W. quarters are occupied by gov. offices, public buildings, luxurious hotels, and the residential flats and villas. In this E. portion, besides the Arab city, there are the quarters of the Copts or Christians, of the Jews, and of the Franks. Wealthy Cairenes live in Garden City, a residential plot on the banks of the riv.; in Gezireh, a long, thin is. in the Nile; or in the suburbs of Heliopolis, Maadi, and Helwan. The poor live around and among them, in dirty and tenements and mud-brick houses. The bazaars are always interesting, especially the Khan-el-Khalil, the Hamzawi, and the Brass Bazaar, though the Muski, which leads to them, is gradually losing its oriental character. Azhar Univ.,

whom Mehemet Ali slew. It was the latter who built the alabaster mosque in the citadel, whose dome and slender minarets are one of the picturesque landmarks of C., and in the centre of which is the celebrated Joseph's well. The airport lies just outside C. to the NE. and is used by international airlines. The most N. part of the city consists of broad boulevards, with European-built villas, hotels, etc. The first experimental flight from C. to the Cape was made in 1920 by Lt.-Col. Pierre van Ryneveld and Capt. Brand, but it was not until April 1932 that the Brit. air route between C. and the Cape became available to passengers, the first experimental air mail being operated at Christmas 1931. The total pop. in 1907 was 654,476, of which some 40,000 only were Europeans. In 1947 the pop. was 2,100,486. The first visible step in the Brit. evacuation of Egypt was taken in C. on 4 July 1946, when the citadel was handed over to Egypt in a simple ceremony lasting half an hour. Egyptian troops took over the barracks in the historic fortress, built in the 12th cent., which had been occupied by the British for 65 years. See S. Lane-Poole, *The*

Story of Cairo, 1906; R. C. Devonshire, *Some Cairo Mosques and their Founders*, 1921, and *Rambles in Cairo*, 1939.

Cairo, city and co. seat of Alexander co., Illinois, U.S.A., riv. port and railway centre at the junction of the Mississippi and Ohio Rs. (both bridged), 125 m. SE. of St. Louis and 360 m. SSW. of Chicago. Since the disastrous flood of 1858 it has been protected by earth levees (now averaging 21 ft high and reached to the Gulf of Mexico). It is the shipping centre of the agriculturally rich, delta-like 'Little Egypt.' It was an important military base in the Civil war, and is understood to have been the original of Dickens's 'Eden' in *Martin Chuzzlewit*. Pop. 12,100.

Cairo Declaration, made on 1 Dec. 1943, committing the U.S.A., China, and Great Britain to definite terms which fixed new boundaries for Japan on the assumption of her defeat. Japan was to be compelled to return to China all Chinese ter., including Manchuria. She was to be ousted from Korea, which 'in due course' was to become free and independent. China was to recover Formosa, conquered by Japan in 1895, and the Pescadores. These provisions achieved the objective of Amer. policy in the Orient, set 50 years previously, to re-establish the territorial integrity of China as it was before the First World War waged against her by Japan. Japan was also to be 'stripped of all the is. in the Pacific' which she occupied during the First World War. These were the Carolines, Marshalls, and Marianas, which Japan had been allowed to retain by the Versailles settlement of 1919, nominally under mandate from the League of Nations. Japan was also to be ousted from all the ter. she had dominated or occupied since the summer of 1910. In short, Japan was to be expelled from the Asiatic mainland and to lose her sea power in the Pacific. She was to revert once more to the condition of an is. nation as she was before her first conquests of Chinese ter.

Cairo Montenotte. It. vil., in Liguria (q.v.), 13 m. NW. of Savona (q.v.). It was the scene of the first victory of Napoleon (q.v.) over the Austrians in 1796.

Cairoli, Benedetto (1825-89), it. statesman and soldier, b. Pavia. He accompanied Garibaldi to Sicily in 1849, where he fought at Calatafimi and at Palermo; and to the Tirol in 1866, where he fought at Mentana. In 1870 he conducted the negotiations with Bismarck. In 1878 C. formed a cabinet with a Francophile and Irredentist policy. General indignation was caused by his policy at the Berlin Congress, where Italy secured nothing, and his term of office only lasted 9 months. In 1879 the Cairoli-Depretis ministry was formed, C. holding the office of premier and foreign minister, but his failure to foresee and intervene in the Fr. occupation of Tunis led to his political eclipse, 1881.

Caisson, in engineering work, is a chamber of sheet iron, or sometimes wood, used in laying the underwater foundations of piers of bridges, quay walls, or dams. They are an integral part of, and permanent shell for, such foundations, and in

this way they differ from coffer dams. One type consists of a strong timber platform, to which sides are attached. One or two of the lower courses of masonry are built on to this, whilst it stands near the shore, and it is then floated out and sunk over the site of the pier, already levelled by dredging or otherwise. Previous to this, however, the detachable sides are removed. The C. of another type is bottomless, but provided with a cutting edge which digs into the earth on the application of weight. When enough earth has been excavated to allow the C. to sink to the required depth, concrete is shot into it to make the foundation solid. If the soil is hard and stony a different structure is used. The lower part of the C. is turned into a water-tight compartment, whose basis is the riv.-bed, which may be duly levelled by hand excavation. This air chamber communicates with the outer atmosphere by an air-lock, which serves as the means of entry and exit of both workmen and materials. Air is pumped down the metal column at a pressure corresponding to the depth below the surface of the water. When the men want to come out, the air of the lock is lowered to atmospheric pressure; it is raised to the pressure of the compartment when they want to return to work. When the men have excavated down to a reliable stratum—the foundations of the piers of Forth Bridge reach down to the rock 75 ft below high water—their working chamber is filled with concrete through the shafts, and the bottomless C. is thus left embedded in the work. Before such a C. is floated out, plate-iron walls are fastened round the strong roof of the working compartment, to form an upper, open box, in which the pier or quay wall is built up as the C. sinks. In more recent times the process has been made cheaper by the use of screw-jacks to raise the C., once the solid rock or bed has been reached. The lifting continues till the pier rises above the water level, when the C. is ready for use elsewhere. Graving docks are often closed by means of closed iron or 'ship' C.s. These rise when the water level inside is the same as that without, and can then easily be floated to recesses at the side. Pneumatic C.s can be used in depths up to over 100 ft of water, but for depths over about 110 ft, the dredging well system is used. In shipping a C. is a hollow structure, provided with an air chamber, for lifting a vessel out of the water for repairs. It is sunk by being filled with water, hauled underneath the ship, and then raised by being pumped dry again. In military language a C. is an ammunition wagon. See D. H. Lee, *Sheet Piling, Coffor Dams, and Caissons*, 1945.

Caisson disease is the name given to the group of morbid changes suffered by C. workers and divers. The symptoms include obstructed respiration, vomiting, pains in the joints or muscles, deafness, and paralysis, and even death may supervene. These symptoms do not appear while the pressure is being increased nor during its continuance, but

only after it has been removed; and they are due to effervescence of gases absorbed during exposure to pressure. The disease is best circumvented by preparing for the immersion gradually, and leaving it gradually.

Caistor, small mkt tn in N. Lincs, England, formerly the site of Brit., and later of Rom., settlements. It has an interesting church, dating from the 13th cent. It is the centre of an extensive rural dist. Pop. 1910.

Calithness, co. in the extreme NE. of Scotland, whose boundaries are Pentland Firth on the N., which separates the mainland from the Orkneys, the N. Sea on the E., and Sutherland to the W. and S. The chief promontories of the bleak rugged coast are Ord, Noss, Duncansby, Dunnet (346 ft), the most northerly headland of Great Britain, and Holburn. The Rr. Forss and Wick Water drain Lochs Shurrery and Watton respectively, and the Thurso empties itself into Thurso Bay. The highest mt is Morven in the S. (2313 ft). The is. Stroma and the Pentland Skerries belong to this co. Wick and Thurso are the chief tns. C. shares a sheriff with Orkney and Shetland, and a member of Parliament with Sutherland. In spite of the severity of the winter storms and the prevalence of northerly gales, the great belt of the Atlantic prevents excessive or continuous cold. The soil is poor and the moorland barren, yet good crops of barley, oats, potatoes, etc., are grown. The wool of the native sheep is in high demand, but the inhab. live chiefly by the cod, lobster, and especially the herring, fisheries. The salmon fishing of the Thurso and the shooting preserves are excellent. Flagstones are quarried at Thurso and Ilalkirk. Though there are rocks of quartz-schists, the chief strata belong to the Old Red Sandstone age. The 'stacks' or detached sandstone pillars by the cliffs are impressive. Area 438,333 ac.; pop. 26,000.

Caius, see **GAIUS**.

Caius, John (1510-73) (also known as John Kaye—C. being the Latinized form of his surname), the second founder of C. College, Cambridge, b. Norwich. He entered what was then Gonville Hall in 1529, and 4 years later was elected fellow. After gaining his M.D. at Padua in 1541 and travelling in Europe, he returned to England, where he gave anatomy lectures in London and became a favourite physician of Philip and Mary. Made fellow of the College of Physicians in 1547, he was, during his membership, 9 times president. In 1557 he built a new court to his old college, endowed it with sev. estates, and in 1559 became master, and as a staunch Catholic put his Protestant fellows in stocks for burning his vestments. He obtained permission for C. College to have the bodies of 2 malefactors each year for dissection, and may therefore be regarded as a pioneer in the cause of anatomy. Edward VI, Queen Mary, and Queen Elizabeth all employed his services as physician.

Caius, or **Gonville and Caius College**, Cambridge, founded in 1348 as Hall of the

Annunciation by Edmund Gonville, rector of Terrington in Norfolk, who d. in 1351, leaving his foundation to be completed by his executor Wm Bateman, Bishop of Norwich. The college was removed to its present site in 1353. It was refounded as Gonville and C. College by Dr John C. (q.v.) in 1557, who later built C. Court and the 3 Gates—of Humility, of Virtue, and of Honour. The original Gate of Humility, the entrance to the college from Trinity Street, was removed when Tree Court was built in 1868, but the others are still preserved. The chapel, completed about 1380, contains monuments to John C. and other masters and fellows.

Caivano, It. tn, in Campania (q.v.), 7 m. N.W. of Naples (q.v.). Pop. 15,000.

Cajabamba: 1. City, cap. of C. prov., in the Cajamarca dept, Peru, in the Andes, 40 m. from Cajamarca tn. Pop. 3480.

2. Tn of Chimborazo prov., Ecuador, on the railway between Quita and Guayaquil; an agric. centre. Pop. 1850.

Cajamarca: 1. N. dept of Peru, bordering on Ecuador, crossed by the Andes. It is an important wheat-growing area; and silver, copper, and coal are mined. Area 12,541 sq. m.; pop. 538,120 (plus some 30,000 Indians).

2. City, cap. of above dept and of C. prov. Ruins of anct Peruvian architecture remain; the 'house of Atahualpa', the last Inca leader, who was captured here by the Spaniards in 1532, and the 'seat of the Inca' of Santa Apolonia Hill above the tn. At Jesús (10 m. SE.) are the warm, sulphuric, mineral baths, 'Baños del Inca', which are still frequented. C. is an important seat of agric. trade and manufs. There are gold- and silver-mines near by. Pop. 15,550.

Cajanello, Duchess of, see **EDGREN**, ANNA CARLOTTA.

Cajeput-tree is the name given to *Melaleuca leucodendron*, a species of Myrtaceae, and occasionally to *Litsea californica*, a species of Lauraceae. *M. leucodendron*, a native of Asia and Australia, is a small evergreen tree, with spikes of white flowers, which is often cultivated in hothouses. An aromatic oil, known as oil of cajeput, is distilled from the leaves of var. *minor*.

Cajetan, **Jacopo** (Tommaso de Vio) (1469-1531), It. theologian, surnamed C. from his see of Gaeta (Cajeta). He entered the order of St Dominic, 1484, studying at Naples, Padua, and Ferrara. Prof. of theology and philosophy at Brescia, Pavia, and Rome; general of his order, 1508. Leo X made him a cardinal in 1517, sending him soon after as legate to Germany, to urge the emperor and Scandinavian kings to form a league against the Turks, and to bring Luther back into communion with the Church. Appointed legate to Hungary in 1523, he was recalled by Clement VIII; in 1527 he was made prisoner at the sack of Rome. His works were collected in 1639. They include trans. of the Bible; *Commentary on the 'Summa' of Thomas Aquinas*; and *On the Authority of the Pope*, a work censured by the Sorbonne. See Ekerman, *Dissertatio de Cardinali Cajetano*, 1761; Schilback, *De*

Vita ac Scriptis de Vio Cajetani, 1831; Cossio, *Il cardinale Gaetano e la Riforma*, 1902.

Cakile is the generic name of 4 cruciferous plants found in Europe and America. The tap-root is very long, the shoots are prostrate, the leaves fleshy, and the fruit is a 2-jointed silicula in which only 1 seed comes to maturity. *C. maritima* is the common sea-rocket, *C. americana* the Amer. sea-rocket.

Calabanga, tn on the is. of Luzon in the Philippines, situated on a small riv. which runs into the Bay of San Miguel. The weaving of hempen material and the manuf. of hats are the prin. industries. Pop. 21,791.

Calabar: 1. Dist. in SE. of the Federation of Nigeria (q.v.), in which much palm oil is produced.

2. Old C., seaport on the C. R. above C. estuary. The pure Negroes, the Efiks, who migrated to C. about 1725, live in Duke Town in the valley, whilst the prin. buildings are on the hills. The vegetation is luxuriant, and palm oil and kernels are the chief export. Pop. about 15,000.

3. New C., name of a port and riv. 100 m. to the E.

History of Calabar. C.'s prosperity was based on the slave trade. With the abolition of the overseas trade in slaves the dominant tribe, the Efiks, were secure in their strategic position near the coast, and as the oil traffic grew they consolidated their power and wealth. But they were a degraded people. Any purity of race which may at one time have been theirs had been obliterated by concubinage with slaves of other tribes. But they were important to the European traders, for whom they acted as middlemen in getting oil from inland. Much good was effected by the Scottish mission which went out to C. in 1846, but the fight against cruelty and superstition has been slow and bitter. Magic is the keynote to which native life is attuned. The savagery of this heathenism was never more apparent than at the death of a chief. Countless victims were slain to keep him company, or give him consequence on his arrival in the ghost-land.

In 1884 a Brit. consul estab. himself at C., and in 1889 a protectorate was proposed with consular jurisdiction for Brit. subjects, its H.Q. to be at Duke Town. The most remarkable of all the women missionaries in C. was Mary Mitchell Slessor, after whom is named the Slessor Memorial Home at Ikot Obong. The story of this quiet, fearless woman of indomitable character has been told by W. P. Livingstone in his classic of missionary biographies, *Mary Slessor of Calabar*. One of the most important events in the hist. of W. Africa from the religious and political point of view was the destruction of the Long Juju at Arochuku, for this freed the country for ever from the evils of slave raids and slave-dealing on an organised scale. To break the unholy influence of the Aros, a military expedition converged on the Aro strongholds in 1901. Its work was completed by Mar. 1902, and thereby an important

new area was opened up to mission work. With the coming of the gov. and the development of trade, C. had now become a prosperous port. See D. M. McFarlan, *Calabar: the Church of Scotland Mission, 1846-1946*, 1946.

Calabar Bean, or the ordeal bean of Calabar, is a species of Leguminosae, *Physostigma venenosum*, found in tropical Africa. It is a perennial climbing plant with a slender stem which attains a height of 50 ft; the flowers are peculiarly formed and have a spurred keel. The dried seed was used formerly by the natives of Africa to test people accused of witchcraft, and it possesses very dangerous poisonous properties; guilty persons were supposed to succumb to its action, and innocent ones to escape. It is of great value in ophthalmic surgery, as its application to the eye contracts the pupil, and frequently relieves pain, e.g. in glaucoma; in tetanus and other nervous diseases it is also of value. The bean owes its importance to the presence of eserine, an alkaloid which it contains.



CALABASH PLANT AND FRUIT

Calabash, the hard shell or woody epicarp of the fruit of the C.-tree, *Crescentia cujeta* (Bignoniaceae), which is gourd-shaped and used as a vessel after scraping out the pulp in tropical America. The C. cucumber or Bottle-gourd is the fruit of *Lagenaria vulgaris* (Cucurbitaceae), an ann. climber of Asia and tropical Africa; the empty gourds being made into cups, basins, etc., sometimes polished and carved, in most tropical countries. The C. nutmeg is *Monodora myristica* (Annonaceae), a tropical African evergreen tree, bearing a small globose fruit packed with oily seeds of nutmeg flavour. The perennial climber, *Passiflora maliformis*, of tropical America, also bears a small yellowish globose fruit with very hard shell and grape-like juice, known as Sweet C.

Calaber, Gk poet, see QUINTUS CALABER. **Calabozo**, tn of Guárico state, Venezuela, a trading centre in the midst of a cattle-raising country. Until 1934 it was the state cap. Pop. 3720.

Calabria: 1. In Rom. hist. is the name of the modern prov. Lence in the heel or SE. extremity of Italy. The peninsula is flanked W. and E. by the Gulf of Tarentum and the Adriatic Sea. In spite of the lack of rivs., its soil was fertile, and in anct writers there is constant mention of its pastures, olives, vines, and fruit trees. Although C. once boasted 13 populous cities, only Tarentum and Brundisium (qq.v.) retained their importance at the end of the 1st cent. BC. The name C. was transferred to the ter. of the Brutii after its subjugation by the Lombards, AD 668.

2. Modern region (*compartimento*) of S. Italy, comprising the provs. of Catanzaro, Cosenza, and Reggio di Calabria (qq.v.). It is the 'toe' of Italy, and is bounded N. by Basilicata, W. by the Tyrrhenian Sea, and E. by the Gulf of Taranto and the Ionian Sea (qq.v.). It contains 2 groups of the S. Apennines (q.v.); in the S. group is the peak of Aspromonte (q.v.). It is subject to earthquakes and flooding. There are some mineral deposits (molybdenum), and there are hydro-electric plants, and chemical and zinc industries (Crotona, q.v.). Stock is raised on the hills, and fruit, olives, vines, cereals, and tobacco are produced. The chief tn is Reggio. Area 5805 sq. m.; pop. 2,104,000. During the Second World War the Eighth Army (q.v.), including Canadian troops, crossed the strait of Messina (q.v.) to invade the It. mainland on 3rd Sept. 1943. They were covered by air and naval bombardment, and by a barrage from hundreds of guns massed along the strait, but it was apparent that no serious effort was being made to defend either S. C. or Apulia (q.v.). See ITALIAN FRONT, SECOND WORLD WAR, CAMPAIGNS ON. See also E. Lear, *Journal of a Landscape Painter in Southern Calabria, 1852*; C. T. Ramage, *The Nooks and Byways of Italy, 1868*; N. Douglas, *Old Calabria, 1915*.

Caladium, family Araceae, genus of 16 tropical Amer. rhizomatous herbs, of which *C. bicolor*, *C. picturatum*, and *C. schomburgkii*, and varieties, are cultivated in moist stove conditions for the beauty of their crimson, white, and yellow marked and spotted leaves. *C. bicolor* and others have edible roots known as Cocoa Roots in the tropics.

Calafat, or **Kalafat**, tn of Rumania, situated on the l. b. of the Danube, almost opposite the Bulgarian fortress of Vidin. It is connected with Craiova by rail, and has a large grain trade. It is of historical interest, having figured in many wars. Pop. (1930) 7600.

Calagurris Nassica, see CALAHORRA.

Calahonda, see MOTRIL.

Calahorra (anct Calagurris Nassica), Sp. tn in the prov. of Logroño, on the Cidacos. It is famous because of its defence by Sertorius (q.v.) against Pompey (see POMPEIUS) in 76-72 BC. There is a cathedral, and the tn is the centre of a pilgrimage. C. trades in wine, oil, and cattle, and it has a pepper industry. Quintilian (q.v.) was b. there. Pop. 13,100.

Calais, seaport of France, in the dept of

Pas de Calais, 148 m. N. of Paris. It is on the strait of Dover, 21 m. ESE. of Dover (q.v.), and owes its prosperity to the fact that it lies on the shortest crossing to England. It rose to importance after the end of the 10th cent., and was, in the 13th cent., a busy mercantile port. In 1346 it was besieged by the English, under Edward III (q.v.), and fell after a siege which lasted almost a year. At its capitulation is said to have occurred the incident of the 'Burghers of C.' when 6 notable citizens, led by Eustache de St Pierre, appeared in penitential garb before Edward and offered themselves for execution, these being the terms upon which the king had agreed to spare the tn from vengeance; the 6 burghers were set free at the entreaty of Queen Philippa, and the happening is commemorated in a fine statue by Rodin. C. remained in Eng. hands until it was retaken by the Duc de Guise in 1558 (see MARY I). For a large part of the Middle Ages it was an important staple tn—after 1347, in wool, leather, tin, and lead (see STAPLE).

The old part of the tn, C.-Nord, which was Flemish in appearance, was laid in ruins during the Second World War, and its anct buildings, including the 16th-cent. citadel, were lost. The modern tn, called St-Pierre, lies to the S. and SE.; it has a notable tn hall (1910-22) in Flemish Renaissance style with a belfry 240 ft high. The harbour is to the N. of the tn, and its basins, from which sev. waterways extend inland, surround the old tn. To the N., also, are bathing beaches and a casino. C. has herring and mackerel fisheries, and has a very large production of tulle and machine lace; there are also embroidery, silk, flour, and metallurgical industries. The tn is a centre of mail and passenger traffic between England and the Continent, and has a large import and export trade. C. was a target for bombardment in both world wars. During the First World War it was a Brit. base, and in the course of the war the port equipment was much improved to cope with military needs. In the Second World War the tn was the scene of an epic defence, when 3000 Brit. and 800 Fr. troops, assisted by 2 patrolling Brit. destroyers, held out from 22 May to 27 May 1940, against 2 Ger. panzer divs., supported by waves of dive-bombers. The first purpose of the defence was to support the withdrawal of the main body of the B.E.F. on Dunkirk (q.v.); that the famous evacuation from the Dunkirk beaches became possible was due in no small measure to the time gained by the fortitude and sacrifice of the defenders of C. The besieged force was short of all supplies, had little protection against the Ger. bombers, and was fighting in very hot weather in the middle of a burning tn; its task was further complicated by streams of refugees and by Fifth Column (q.v.) snipers. Only 30 survivors of the defence were taken off by the navy before the tn fell. Pop. 60,400. See WESTERN FRONT IN SECOND WORLD WAR.

Calais, **Pas de**, see PAS-DE-CALAIS.

Calaisis, name of Calais and the

adjoining dist., occupied by the English from 1347 to 1558, and then reconquered by the French, who called it the *Pays reconquis*. It now forms part of the arron. of Boulogne and of St Omer.



CALAMINTHA

Calamander Wood (probably from Coromandel Coast), very valuable cabinet wood, like rosewood, only more beautiful and durable. Produced from the *Diospyros hirsuta* or *quaesita* of the family Ebenaceae, of the same genus as the ebony and persimmon trees. A native of SE. India and Ceylon, it is becoming very rare. It yields veneers of exceptional beauty, and takes an exquisite polish. The colouring is largely chocolate and fawn. One cub. ft weighs about 60 lb.

Calamary, *Loligo vulgaris*. A variant name for the squid.

Calamata, or **Calamae**, cap. of the dept of Messenia, in Greece. It is the anc. Pharae. There is a mediaeval castle. C. was sacked by Ibrahim Pasha in 1825. The dist. is very fertile. Pop. 38,000.

Calamba, municipality in the Philippine Is., 30 m. from Manila, a centre of the sugar industry. Pop. 36,586.

Calambae, see **ALOE WOOD**.

Calame, Alexandre (1810-64), Swiss painter and engraver, was b. at Vevey, where his father was a stone-cutter. He studied painting at Geneva and travelled for some time in England, Holland, Germany, and Italy, but is remembered for paintings and etchings of his native Swiss scenery. A Calame prize for landscape was instituted in 1874, one winner being Ferdinand Hodler.

Calamianes, group of is. belonging to the Philippines, situated midway between Mindoro and Palawan. They have an estimated area of 615 sq. m. The prin. is. is Busuanga, about 35 m. long. The chief product is rice. There are also fishing and the mining of manganese. Pop. 16,445.

Calamine, term applied to 2 ores of zinc and an alloy: 1. Zinc carbonate,

occurring in rhomboid crystals, white, yellow, brown, green, or grey in colour, sometimes translucent. It is found at Matlock, Mendip, Alston Moor, Leadhills, and at Wanlockhead in Dumfriesshire.

2. The native hydrous silicate of zinc, occurring in white, green, blue, or yellow crystals, and usually found associated with carbonate. It is also called smithsonite and hemimorphite. C. is used as a pigment in the painting of pottery, producing a fine green colour.

3. An alloy of zinc, lead, and tin formerly used as a protective coating for iron utensils.

Calamintha, or **Calamint**, family Labiatae, genus of herbs and shrubs of N. temperate regions. *C. ascendens*, Common C., *C. nepeta*, Lessor C., and *C. intermedia*, Wood C., are native to Britain, on calcareous soils. *C. alpina*, of Hercegovina, and *C. glabella*, N. America, are good rock garden plants, and *C. grandiflora* is herbaceous.

Calamis (fl. 440 BC), Athenian sculptor who made statues of Apollo, Aphrodite, and Hermes, as well as part of a chariot group, commissioned by Hiero, King of Syracuse. Archaeologists cannot point to any work as incontestably his, but the bronze Delphic charioteer expresses so well what are considered his qualities, that there is some justification for the attribution of this masterpiece to C. Pliny speaks of his grace and delicacy, and these qualities at once impress the student as he observes the refined, almost feminine, expression of the charioteer's face and the charming simplicity of the straight folds of his long and flowing chiton. Certain conventionalities in the treatment of head and drapery further convince the student that the statue must be the work of a predecessor of Myron, Polyclitus, and Phedias.

Calamus, generic name of 200 species of tropical palms native to Asia, Africa, and Australia. Most of these plants are leaf-climbers with long thin stems, and many have hooks growing from the under side which become attached to passing objects and prove very troublesome. The stem of *C. scipionum* supplies Malacca cane, of *C. rotang*, *C. rudentum*, *C. tenuis*, and *C. verus* rattan-cane, while *C. draco* yields the 'dragon's blood' of commerce, used in the preparation of printers' blocks and for red lacquers. See also **FLAG**.

Calamy, Benjamin (1642-86), Prebendary of St Paul's; son of Edmund C. the elder (q.v.), the Presbyterian divine. Educ. at St Paul's and at Cambridge, he became chaplain-in-ordinary to the king (c. 1677). His *Discourse about a Doubting (scrupulous) Conscience* appeared in 1683. It was dedicated to Jeffreys. The Non-conformists accepted it as a challenge, replying to it by Dr Laune's *A Plea for the Nonconformists*, which cost its author his life, in spite of C.'s intercession. The execution of his parishioner and friend Henry Cornish (d. 1685) broke C.'s health. See *Biographia Britannica*, iii, 1784; T. Birch, *The Life of Dr John Tillotson*, 1753; E. Calamy (ed. J. T. Rutt), *An Historical Account of My own Life*, 1829.

Calamy, Edmund, called the elder (1600-1666), clergyman, b. Walbrook, London. Educ. at Cambridge, where he joined the Calvinists, he became chaplain to the Bishop of Ely. From 1626 to 1636 he was a lecturer at Bury St Edmunds, but later left the Anglican Church for the Presbyterian, becoming in 1639 minister of St Mary, Aldermanbury, London. Here he officiated for 20 years, being throughout a supporter of the Royalist cause, and becoming chaplain-in-ordinary to Charles II. He was one of the Presbyterian representatives at the Savoy conference in 1661, but was ejected from his living in the next year under the Act of Uniformity. He was one of the 5 compilers of *Smectymnus* (q.v.), 1641, a polemical work written in reply to Bishop Hall's *Episcopacy by Divine Right*, 1640.

Calañas, Sp. tn in the prov. of Huelva, in a copper-producing dist. Pop. 12,000.

Calandra, genus of insects belonging to the Curculionidae, or weevils. *C. granaria*, the corn-weevil of our granaries, is a little beetle which bores a hole in the grain and there deposits its eggs, which hatch into a destructive grub. *C. orizae* infests rice, and *C. palmarum* lives during its larva state in the pith of palms of S. America.

Calantas, Philippine cedar, *Cedrela toona*, a lasting wood, red in colour and much used in making cigar boxes, and lining ceilings and walls; also for building canoes. See TIMBER.

Calanus, an anc. Hindu philosopher, belonged to that sect known to the Greeks as Gymnosophists. According to Plutarch, his real name was Sphines. He came into close contact with Alexander the Great, and spent some time at his camp in India. At Pasargadae he became sick, and, at his own request, was burned alive on a funeral pyre. Just before his death he is reported to have said to Alexander: 'I shall soon see you again in Babylon,' a speech which is regarded as a prophecy in the light of Alexander's death at Babylon a few months later. See the *Anabasis* of Arrian.

Calappa, typical genus of the Calappidae, is a brachyurous decapod crustacean with a rounded and crab-like cephalothorax. The species have crested claws, and the abdomen is hidden under the thorax. Their geographical distribution is wide, and they are found in the warm seas. *C. granulata* is a crab which occurs in the Mediterranean.

Călărăsi, tn in Rumania, 60 m. ESE. of Bucharest. It is situated on the Borcea, a branch of the Danube, and has a good export trade in timber, wheat, hemp, and linseed. Pop. (1930) 18,000.

Calas, Jean (1698-1762), Fr. Protestant merchant, accused, with his wife and family, of having strangled his son, Marc Antoine (who had almost certainly committed suicide), to prevent his turning Rom. Catholic. They were sent to the rack in order to extort confession, and C. was condemned by 8 judges of Toulouse to be broken on the wheel. This judicial murder caused an agitation in which Voltaire played a leading part. His efforts

eventually got the sentence against the victim annulled, compensation being awarded to his family, and they also resulted in the amelioration of the legal position of Fr. Protestants. In 1765 the stigma was removed from C.'s name. See R. Allier, *Voltaire et Calas*, 1898, and M. Chassaigne, *L'Affaire Calas*, 1929.

Calascibetta, tn in Sicily (q.v.), in the mts. 3 m. N. of Enna (q.v.). It has a trade in wine, olive oil, and silk. Pop. 9000.

Calasião, municipality of Luzon, Philippine Is. Pop. 23,269.

Calasparra, Sp. tn in the prov. of Murcia, with a busy agric. market. Pop. 5000.

Calatafimi, tn in Sicily (q.v.), standing on a hill 21 m. SE. of Trapani (q.v.). Garibaldi (q.v.) defeated the Neapolitans near here in 1860. Four miles NW. are the ruins of the anc. *Segesta* (q.v.). Pop. 10,000.

Calatayud (Arabic *Kalut Ayub*, 'Ayub's castle'), Sp. tn in the prov. of Zaragoza, on the Jalón, founded by the Moors in the vicinity of Bilbilis (q.v.). It has a collegiate church, originally a mosque, and a 12th-cent. church of the Knights of Jerusalem. The tn is picturesque, has rock dwellings, some of which are inhabited, and is a busy market tn. Pop. 19,800.

Calathea, genus of Marantaceae consisting of perennial herbaceous plants which are natives of tropical America. The leaves are very beautiful, and most species have a petaloid staminate. In the W. Indies the tubers of *C. allouia* are used as a substitute for potatoes.

Calathus, genus of coleopterous insects of the family Carabidae, or ground-beetles. The species are generally black or brown, and *C. cistelloides*, a black beetle with black antennae, red at the basal joint, and either red or black legs, is commonly found on Eng. pavements.

Calatrava la Vieja, Sp. fortress in the prov. of Ciudad Real. It is on the Guadiana in the dist. called Campos de C., and in the Middle Ages was looked upon as the key to the Sierra Morena (q.v.). It was taken from the Moors in 1147, and the military order of C. was founded here in 1158.

Calaveras, co. of central California, U.S.A., called after R. C., which runs through it to join R. San Joaquin, about 12 m. below Stockton. Bounded NW. by Mokelumne R., SE. by Stanislaus R. Dams (Pardee, Calaveras, Melones) store water for power and irrigation. On the E. is the Sierra Nevada. C. has rich gold- and copper-mines, and contains one of the most famous groves of *Sequoia gigantea*. Cap., San Andreas. Area 1028 sq. m.; pop. 9902.

Calaverite, telluride of gold; contains about 44 per cent of gold and 2 to 3 per cent of silver. It is a compact mineral and massive, and resembles pale pyrites but is of greater density. It occurs in volcanic rocks in Colorado and in W. Australia. The name comes from Calaveras, Colorado, where it was first found.

Calbayog, municipality in Samar Is., one of the group of Philippine Is. Corn

and rice are grown, and there is fishing. Pop. 79,503.

Calcaire Grossier, name of a number of limestones and marls very rich in fossils. They developed in the Paris basin, and date back to the middle of the Eocene period.

Calcareous Rocks, Soils, Tufa, etc. (from Lat. *calx*, limestone): 1. Rocks that contain much lime, especially in the form of carbonate (CaCO_3), whether calcite or aragonite. Usually such rocks are aqueous, and those formed in the sea are largely composed of the fossilised remains of marine animals (brachiopods, corals, crinoids, echinoderms, molluscs, and the like). Many Palaeozoic limestones are composed of shells, corals, etc., some younger limestones are made of foraminifera. These rocks are mostly of organic origin, the lime salts of sea-water being extracted by the living tissues of these animals and deposited in the form of carbonate of lime by shell-secreting membranes. Others are formed as precipitates by the evaporation of C. solutions, e.g. stalactite and calc-sinter (C. tufa), and probably oolite (all chemically formed). A crystalline structure, varying from partially crystallised limestones to granular statuary marble, is produced by metamorphic action. Marbles are usually associated with the crystalline schists and the contact rocks developed by the action of heat given out by great masses of cooling granite to surrounding rocks. The existence of the carbonate in rocks can be discovered by applying dilute nitric or hydrochloric acid. Effervescence is thus caused through liberation of carbonic acid. Quicklime is obtained by calcining these rocks. 2. C. soils are produced by disintegration of C. rocks. When these rocks are pure they yield rather barren soils of little agric. value, as is the case in many chalk and limestone dists. of Britain. They are thin and sometimes full of hard flint nodules, more adapted for pasture than agriculture. If the rocks contain lime mixed with clay so as to form marl, with a little vegetable matter added, they form a good, friable, rather light soil. It is rather difficult of drainage, as soft lime retains water so readily, but yields it up by evaporation. After rain it soon dries on the surface, but rarely suffers from severe drought. C. soils, being light in colour, absorb heat slowly. They are often rich in phosphates, but lack potash. Most soils are improved by a certain amount of C. matter. Peaty soils are often dressed with chalk. See *Fream, Soils and their Properties*, 1890; F. H. King, *The Soil*, 1900; R. G. McConnell, *Agricultural Geology*, 1902; A. D. Hall, *The Soil*, 1904. 3. C. tufa, or calc-sinter (calc-tuff), also travertine, stalactite, onyx, are porous deposits of carbonate of lime, formed by the waters of C. springs. Water charged with carbonic acid can dissolve carbonate of lime out of the rocks, and, when it emerges into the air, deposit part of it again as an incrustation. Such springs are sometimes called petrifying springs, as objects placed in the water are covered with the

deposit. There are noted examples of these at Matlock, and at Tivoli, near Rome. The formation there is hard and compact, and much 'travertine' is used as a building stone at Rome. Other well-known springs are at Carlsbad, Bohemia; at Clermont in Auvergne; and in the Yellowstone region, N. America. C. incrustation, often seen in caverns in limestone rocks, are varieties of C. tufa, and are called stalactites and stalagmites. When free from impurity the deposit is white or translucent, but often it is stained with other substances, and is yellow, brown, or grey in colour, and sometimes variegated. It is a spongy, cellular, or concretionary structure, often banded, and showing rings of growth. It is found in a variety of forms, massive, tubular, botryoidal, or encrusting animal and vegetable remains, such as leaves, twigs, moss, nuts, or insects. It is often quarried for building purposes, being soft at first, but becoming hard and solid through exposure to the atmosphere. The temples of Paestum, Italy, were constructed of massive C. tufa. Calc-spar is carbonate of lime, rhombohedral in crystallisation. C. waters are called hard, contain much carbonate and sulphate of lime, and form a deposit when heated.

Calcedony, see CHALCEDONY.

Calceolaria (Lat. *calceolus*, a slipper, from the shape of the flower), genus of plants originally from S. America, Mexico, and the W. Indies, family Scrophulariaceae. There are 2 kinds of C., the herbaceous and the shrubby. The herbaceous varieties are generally grown from seeds, sown in July in a light soil, composed of sand, leaf-mould, and loam. A cool greenhouse suits their growth at all stages, and they flower from May to July. The shrubby kinds are generally produced by means of cuttings that should be taken in Sept. These cuttings should be put in a cool greenhouse after planting them in a soil composed of fine fibrous loam and silver sand. When the roots have struck, the plants should be put in pots and placed in a frame with the sun's direct rays falling on them. At the end of Feb. the plants ought to be nipped off and then transplanted into bigger pots. This transplanting should go on until the 7-in.-size pot is attained, or at all events until they can be planted out, in the month of May. If the shrubby C. is kept growing in pots, it does best in a soil similar to that adopted for the herbaceous variety.

Calchedon, see CHALCEDON.

Calciferol, crystalline substance, formula $\text{C}_{27}\text{H}_{46}\text{O}_2$. It is obtained by simple irradiations of ergosterol (q.v.). It is a pure vitamin D and is present in egg yolk, cod-liver oil, and other fish-liver oils.

Calcareous, geological term for calcium-bearing rocks, usually sandstones (q.v.), the grains of which are cemented together by calcium carbonate.

The C. Sandstone series is the name of the lower part of the Lower Carboniferous rocks of Scotland. The series was deposited in fresh water for the most part, and consists of cementstones overlain by volcanic rocks and oil-shales, together with

sandstones, marls, freshwater limestones, and poor coals. The oil production of Scotland comes from these rocks.

Calcination, metallurgical name for burning or roasting an ore. It can either be performed in an air blast to obtain the oxide, or without air to drive off any volatile constituent such as sulphur.

Calcite, or **Calcespar**, natural carbonate of calcium used, on account of its property of strong double refraction, in making optical instruments. Usually occurs in veins associated with sulphide lead ores or haematite. See ICELAND SPAR.

Calcium, atomic number 20 (symbol Ca, atomic weight 40.1), metal belonging, together with strontium, barium, and radium, to the class known as alkaline-earth metals, on account of the alkalinity of their oxides. It does not occur free in nature, but in combination it is widespread and abundant. The carbonate occurs as limestone, coral, marble, and calcespar (calcite); with magnesium carbonate as dolomite; the sulphate as gypsum and selenite, while the fluoride is fluorspar. Many other rocks contain it, as also do organic bodies, bones being formed chiefly of the phosphate. C. is a silver-white metal forming hexagonal crystals. It is fairly hard and can be hammered out. If left in damp air it tarnishes with formation of hydroxide, but if the air is dry it remains bright for some time. It decomposes water liberating hydrogen, and ignites if heated in air, burning fiercely with a reddish light (hence its use in C. 'flares'). Davy was the first to isolate C. in 1808 in his electrolytic researches. It may be obtained by electrolysis of the fused chloride, and Moissan obtained its crystals by the action of sodium on C. iodide. The excess of sodium is extracted by absolute alcohol. C. is used as a drying agent, as a deoxidiser in hardening lead, desulphurising petroleum, as an alloy with aluminium, and for many other industrial and technical purposes. Compounds of C. are widely used and very important substances. The oxide CaO , or quicklime, is obtained by burning limestone and coal in kilns, the carbon dioxide being driven off from the carbonate. It is white, amorphous, very infusible, and becomes incandescent when strongly heated, and was formerly used with the oxy-hydrogen flame in the old 'limelight.' Mixed with water it forms C. hydroxide or slaked lime, the combination being accompanied by evolution of heat. Slaked lime when mixed with sand forms mortar. C. chloride occurs naturally and as a by-product from many manufacturing processes. It is extremely deliquescent when anhydrous, and is used for drying gases (except ammonia, with which it combines). Bleaching powder, conveniently though inaccurately represented as chloride of lime, is $\text{Ca}(\text{OCl})\text{Cl}$, and is obtained by the action of chlorine on slaked lime. Plaster of Paris is C. sulphate deprived of some of its water of hydration by heat. On adding water rehydration occurs, and selenite is formed and sets in a hard mass. C. carbide, used for production of acetylene, is

produced by heating chalk with carbon in an electric furnace. C. sulphide is a phosphorescent substance used for luminous paint. It is prepared by passing hydrogen sulphide over heated lime. The property of luminosity is probably due to an impurity, for it is found that pure C. sulphide is not luminous. The hardness of water may be classed as permanent or temporary. The first is due to C. and magnesium sulphates and chlorides and the second to C. and magnesium bicarbonates. The latter may be removed by boiling the water or adding lime, so that the insoluble carbonate is formed and by filtration can be removed. Hardness in water is explained by the fact that the sodium stearate in the soap is converted by the C. salts in the water into insoluble C. stearate, which does not lather. C. bisulphite, $\text{Ca}(\text{HSO}_3)_2$, is made by passing sulphur dioxide into milk of lime until no further absorption of the gas occurs. It is used in making lower-grade paper from wood. Wood consists mainly of 2 substances, lignin and cellulose, the second of which is required for paper-making. By steeping wood chips in hot C. bisulphite solution under pressure, the lignin is dissolved, but the cellulose is left unattacked. C. salts when volatilised in the flame of a Bunsen burner produce a brick-red coloration.

Calcreose, drug composed of creosote and lime, and used internally instead of pure creosote. It is a dark brown powder.

Calc-sinter, see TRAVERTINE.

Calculating Machines. From the earliest times the need for mechanical aid in performing long calculations, which require no skill, but merely accuracy, has been felt, and various simple contrivances, such as the abacus, have been invented to meet this want. More complicated machines, providing for various kinds of calculation and degrees of accuracy, have been produced in this country since the 17th cent., one of the earliest being 'Napier's Bones' (q.v.). This appliance, which consisted of 10 rectangular slips of wood, having the digits and their multiples on each of the 4 sides, was intended for use in multiplication and div. Its use was described by the inventor, Napier or Merchiston, in his *Rhabdologia*, 1617, and was received with considerable enthusiasm by the mathematicians of the day. Shortly afterwards Edmund Gunter, prof. of astronomy at Gresham College, produced his surveying chain, scale, logarithmic line, and line of numbers, the principles of which are still in use in the slide rule, much employed by engineers. The calculating machines invented by Pascal in 1642, Sir S. Moreland in 1666, and Leibnitz in 1671 were of little practical use. In the 2 former the addition of each place of figures had to be made separately, while the last, a model of which still exists at Göttingen, was intended for use in astronomical calculation. In 1775 a machine consisting of 12 ten-sided prisms, each face of which had a rack engaging with a toothed wheel, was put on the market by Viscount

Mahon. The prisms were pushed in one direction for addition and in the other for subtraction, and these operations were repeated for multiplication and division. Circular machines were invented in 1779 by Hahn and in 1784 by Müller, but the first invention of the kind of real importance was that made by Charles Babbage about 1822. His machine, which was intended to calculate numerical tables by method of 'differences,' was left uncompleted at his death. The invention of the arithmometer, by M. Thomas de Colmar, about 1850, marked a great stride forward. This machine, which will add, subtract, multiply, divide, and extract square roots, is easily operated by turning a handle, and is accurate and rapid in its results. The mechanical principle is that of toothed-wheel gearing, the wheels being engaged by setting stops to the figures. Several improvements on this machine have since appeared. Another advance was made by the production of adding machines capable of dealing with money columns. One of the first of these was the Burroughs (1888); other Amer. and Brit. inventors have produced variants of this type. The cash registers so largely in use at the present day are a development along the same lines. Some of the most recent of these automatically dispense the correct change. The electric tabulating machine and the planimeter, for use in geometrical calculations, are examples of other kinds of C. M. Other types are the tide-predicting machine invented in 1910 by Lord Kelvin; the area tabulating machine, used chiefly in measuring leather and hides; and the curvometer or kartometer for measuring the length of curves on, for instance, a map of a road.

Mechanical book-keeping provides a method of speedy and accurate posting to ledgers with the advantages that all accounts are kept in a legible and uniform style. Each account shows a balance which is the total of all the items posted to it and is progressive, being increased or reduced according to the nature of the postings, whether debit or credit. The arithmetical accuracy of the postings to the ledger can be checked daily or at any date by extracting a list of the balances. By the use of carbon paper a copy of each item posted to the ledger accounts is recorded line by line so that a complete summary and proof of the work posted for the day is obtained. Where customers' statements are required these can also be provided, being built up gradually as the posting is done during the month or quarter. The statement is usually the original posting, the ledger account and summary sheets being carbon copies.

Mechanical book-keeping, while used principally for sales and purchases ledgers to which large numbers of invoices on cash items are posted daily, is also used for posting the complete set of books. And machines which have typewriters incorporated are particularly useful in as much that accounts in the impersonal and private ledgers which require details and information recorded upon them can be typed on during posting. Such machines

are also used for varied counting-house work such as the entering of the receipts cash book, providing at the same time the customer's receipt, credit posting slip, loose cash book sheet, and bank paying-in slip. There are many different types of machines, each offering methods and systems suited to different business and trades, and machines are designed to customers' varied requirements. *See also* AUTOMATION and ELECTRONIC COMPUTATION.

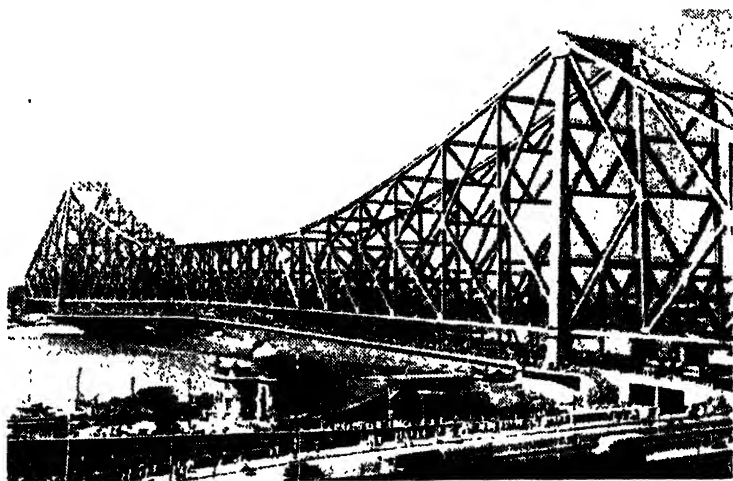
Calculus, branch of mathematics dealing with continuously varying functions. The subject falls into 2 branches, the differential and the integral C. The central problem of the differential C. is the investigation of the rate of change of a function (q.v.) with respect to changes in the variables on which it depends. The 2 main classes of problems of the integral C. are, firstly, finding such quantities as the length of a curve, the area enclosed by a curve, or the vol. enclosed by a surface, and, secondly, the problem of determining a variable quantity given its rate of change. This second type of problem clearly indicates the close relation between the processes of integration and differentiation, the one being considered as the inverse of the other.

Credit for the introduction of the methods of the C. into mathematics is generally divided between Newton and Leibnitz. Newton's approach to the subject, the method of fluxions (q.v.), was actually used by him many years before it appeared in print, by which time Leibnitz had pub. MSS. on the subject. This situation gave rise to a bitter controversy as to the historical priority of authorship. The modern notation follows that introduced by Leibnitz. *See* DIFFERENTIAL CALCULUS and INTEGRAL CALCULUS.

Calculus, in medicine, a concretion forming in any part of the body by the accumulation of matter round a central core. Calculi are variously classified according to their structure, size, composition, and location. *Alternating* or *laminated* calculi are composed of layers of different materials superposed on one another. As regards position, calculi may be *salivary*, formed in the salivary ducts; *arthritic*, or gouty calculi, formed at the joints; *biliary*, or gall-stones, in the gall-bladder; *renal*, in the kidneys; *vesical* in the bladder; and *prostatic*, in the prostate. The method of their formation may vary also. *Organic* calculi are those which have a nucleus of epithelium, blood, etc.; *fatty*, those which have a nucleus of fat; *blood* calculi, consisting of fibrinous matter and blood corpuscles; and *chalky* calculi, consisting of calcium carbonate and calcium phosphate usually with some foreign body as a nucleus. *Urinary* calculi are those formed in the bladder and urinary tract. They consist of concentric layers of substances crystallised out of solution and cemented together by mucus, etc. The substances may be uric acid and urates, or phosphates of calcium and magnesium, or mixed calculi of both urates and phosphates, or calcium carbonate, or organic substances found in

the urine, as cystine, xanthine, and fibrin. The calculi are commonly called gravel, or stones, according to their size. *Secondary* calculi are those formed as a result of the diseased condition of the urinary tract, and are, therefore, often met with in *cystitis* or inflammation of the bladder. Calculi may cause little trouble, and if symptomless are often left alone. On the other hand they may cause inflammation or obstruction of a passage. A gallstone may obstruct the bile ducts and a renal stone may become impacted in and obstruct the ureter or the urethra. The C. in its attempt to pass through a

Court of Judicature was estab. at C. In 1854 Bengal became a lieutenant-governor's prov., but the Governor-General of India retained his H.Q. in C. In 1911 Bengal became again a presidency under a governor, and in 1912 the H.Q. of the viceroy and governor-general were moved to Delhi. Although communication with the sea down the R. Hugli is hazardous, owing to constantly shifting shoals and sand-banks, the port of C. has become, and continues to be, one of the great ports of Asia. Great experience has been acquired of the riv., and the Bengal Pilot Service, which warns every ship using the riv., is



The High Commissioner for India
THE HOWRAH BRIDGE, CALCUTTA

passage, may cause acute colicky pain—e.g. renal colic, biliary colic (see COLIC).

Calculus of Variation, see VARIATION.

Calcutta, cap. city of W. Bengal state, India, one of the great cities of India and of Asia. Situated on the E. bank of the R. Hugli, some 80 m. from the Bay of Bengal, C. was founded in 1687 by Job Charnock, an E. India merchant, on the site of 3 vils., one of which was named Kalikata. A fort was built in 1696, and on account of its position at the mouth of the main water communication for N. India, the settlement flourished and expanded rapidly. Between 1756 and 1758 C. was the scene of much fighting between Brit. troops, under Clive, and Surajah Dowlah, Nawab of Murshidabad. The latter was finally defeated at Plassey (June 1757). The foundations of the present Fort William were laid in 1758, and the whole completed in 1781. In 1774 Warren Hastings became the first governor-general, his authority covering Bengal, Bombay, and Madras. The Supreme

one of the most skilled navigational services in the world. The docks in the port are very extensive and can handle the largest ships which can negotiate the riv. They are well provided with railway facilities. The city has a fine centre, the outstanding feature being the Maidan, an open grassed area or park, originally kept free of buildings as a security measure for Fort William, and now crossed by good roads and largely used for recreation purposes. It leads to the race-course and is itself 2 m. long by about 1 m. wide. In the humid climate of C. it is invaluable as a source of fresh air. During the Second World War one of the main roads across it was used as a landing strip for fighter aircraft. Around the centre C. is a closely packed city and some of the outer suburbs remain severely overcrowded with streets too narrow for modern conditions. Plans for the great improvement of C. have been prepared but must take much time and money to complete. C. continues to share with Bombay the main commercial

interests of the whole of India. Until 1947 C. had a virtual monopoly of the very valuable jute industry, and is also the port for Bengal and Assam tea, and a large proportion of Indian coal. It is the H.Q. of many large Brit. commercial and banking concerns with interests in India and the R. There are 2 main railway stations, one of which is across the R. Hugli at Howrah, the riv. now being spanned by a fine, new cantilever bridge of a single span. The bishopric of C. in the Anglican Church was created in 1813, and the bishop is now Metropolitan of all India. The pop. of C. proper is about 2,600,000, and of Greater C. 4,600,000 (1951).

Calcutta Cup, trophy competed for annually by England and Scotland at rugby football, presented by the Calcutta Club in 1879. *See also FOOTBALL, Rugby Union Football.*

Calcutta Sweepstake, promoted annually by the Royal Calcutta Turf Club. The prizes are given on the result of the Derby horse-race run at Epsom usually on the first Wednesday of June every year, but occasionally on the last Wednesday of May. The 'sweep' was nominally private, being limited to the members of the club, each drawing a number for which he paid about 10 rupees, but experience showed that tickets were freely transferred through members to the general public in all parts of the world. The drawing took place in Calcutta, generally on the Saturday before the Derby was run, and ingenious precautions were taken to ensure perfect fairness. The stakes were very high, and in 1929 3 prizes totalled £135,000; in 1930 it was decided not to publish any figures in relation to the sweepstake.

Caldera, *see* CARAVAGGIO and ITALIAN ART.

Caldas da Rainha, tn. of Portugal, in Leiria dist., 50 m. N. of Leiria (q.v.). It is known for its sulphurous and saline springs; the bathing estab. was founded in 1485 by the queen of John II. Pottery is manuf. Pop. 8200.

Caldas de Reyes (Rom. *Aquae Caltonae*), Sp. tn. in the prov. of Pontevedra, known as a spa since Rom. times. Pop. 9500.

Caldecott, Randolph (1846-86), artist, b. Chester, worked in a bank, 1861-72, but always showed a taste for art. His first sketches appeared in local papers, *Will o' the Wisp*, 1868, and the *Sphinx*, 1869. In 1872 he became a student at the Slade School. He became famous as illustrator of Washington Irving's works. 'Old Christmas' (selections from the *Sketch-book*) appeared 1875, 'Bracebridge Hall,' 1876. In 1882 he became a member of the Institute of Painters in Water Colours, exhibiting there, at Grosvenor Gallery, and at the Royal Academy. He has an enduring place as illustrator, notably of coloured books for children, starting in 1878 with *John Gilpin* and *The House that Jack Built*, ending in 1885 with *Elegy on Madame Blaise* and *The Great Panjandrum Himself*. *See* R. Blackburn. **Randolph Caldecott: Personal Memoir of his Early Art Career**, 1886.

Calder, Sir Robert (1745-1818), Brit. admiral. He entered the navy in 1759, and was present at the battle of St Vincent (1797), on which occasion he was knighted for bringing home dispatches. In 1804 he was promoted to the rank of rear-admiral; in the following year he was stationed off Cape Finisterre to intercept the Fr. and Sp. fleets fleeing before Nelson from the W. Indies. C. succeeded in capturing 2 Sp. ships, but was outnumbered, and retired to Brest. He was tried by court-martial, and censured for an error of judgment. He retired from active service, but rose to the rank of admiral in 1810.

Calder, name of 4 rivs. in England: 1. In W. Riding, Yorks, rising near Burnley and joining the R. Aire at Castleford; length 45 m.

2. In Lancs, joining the Ribble near Whalley.

3. In Cumberland, flowing into the Irish Sea, 10 m. SE. of Whitehaven.

4. In Lancs, joining the R. Wyre at Garstang Church.

Caldera, broad volcanic crater, usually circular in outline and characteristically very much wider than it is deep. C. result from explosive eruptions during which lava is thrown out so rapidly from a volcano that its upper part founders into the emptied space below from whence the lava has come. C. are thus essentially the result of the collapse of the superstructure of a volcanic cone, and only to a small extent the product of fragmentation of the top of the volcano through explosion as was formerly thought to be the case.

Crater Lake, Oregon, occupies the site of a C. 6 m. across which formed during Pleistocene times by the collapse of a lofty volcanic cone following violent eruptions of volcanic ash and pumice. Lake Toba in Sumatra lies in part of a C. which extended for 700 sq. m. and which formed in the Pleistocene when extensive deposits of volcanic ash were laid down in the vicinity.

Calderbridge, vil. of Cumberland, England, in the Ennerdale (q.v.), rural dist. About a mile away are the ruins of Calder Abbey, founded 1134 for Cistercian monks. At Sellafield (2 m.) near by the construction of the first Brit. atomic energy plant was commenced in 1949; in Oct. 1956 it was formally opened by the queen.

Calderon, Philip Hermogenes (1833-98), Anglo-Fr. artist, b. Poitiers, of Sp. descent. He studied in Paris under Picot, and in London. He exhibited at the Royal Academy from 1853, and at the Paris exhibitions of 1867 and 1878. He was elected A.R.A. in 1864, full Academician in 1867, and Keeper in 1887. His subjects were chiefly historical, his most important works being 'The Renunciation of St Elizabeth of Hungary,' 1891, a Chantry Purchase now in the Tate Gallery.

Calderón, Rodrigo (d. 1621), Sp. adventurer, b. Antwerp. He was patronised by the Duke of Lerma, chief minister of Philip III, and eventually became a

secretary of state, in which capacity he roused the jealousy and hatred of the court. On the fall of his patron C. was accused of murder, and, after languishing in prison for 2 years, was tried by order of the Duke of Olivarez, who had become chief minister under Philip IV. He was found guilty and executed.

Calderón, Serafín Estébanez (1801-67), Sp. writer, celebrated for his brilliant sketches of Andalusian scenes and manners, which he contributed to the *Cartas Españolas*, a weekly Madrid magazine. Canovas del Castillo, C.'s nephew, wrote his biography, called *El Solitario y su Tiempo*, 1883.

Calderón de la Barca, Don Pedro (1600-1681), Sp. poet and dramatist, b. Madrid, of a noble family; educ. at the univ. of Salamanca. He showed great precocity, writing a play, *El Carro del Cielo* (The Lot of Heaven), at the age of 13. He seems to have served with honour as a private soldier in sev. campaigns in Italy and the Low Countries during 1623-9, and, having already become famous as a dramatist, was invited to the court of Philip IV, and made a knight of the order of St James about 1636. He produced an enormous number of plays of all kinds, mostly realistic plays, dealing with the love intrigue of 2 pairs of lovers, or tragedies of jealousy and honour, till about 1651, when he entered the church, and in 1653 became a canon of Toledo, thereafter confining himself mainly to works on sacred subjects. He gained great preferments in the church, becoming a chaplain to the king in 1663, and later superior of the congregation of San Pedro. As a dramatist C. ranks second to Lope de Vega, whom he excelled in moral depth and purity and grace of expression. He fell far below Lope in invention and ingenuity, and his work suffers from his disregard of conventional dramatic rules, his brilliant imagination leading him into extravagances. The lofty moral standard of his plays and their refined clearness of language made them a valuable influence in an age when the drama was beginning to suffer from the lasciviousness and floridness of Lope and his school. His plots are always managed with great skill and written with simplicity and precision. His best plays are *El Mágico Prodigioso*, a religious drama somewhat reminiscent of *Faust*, and probably the best known in this country, part of which has been trans. into English by Shelley; *La Vida es Sueño*, a philosophical play; *Príncipe Constante*, a historical drama on the subject of Prince Ferdinand of Portugal, which, together with the former, has been trans. into German by Schlegel; *El Alcalde de Zalamea*; *El Divino Orfeo*; *El Purgatorio de San Patricio*, another religious play; *La Dama Duende*, a perfect example of the 'cloak and sword' play; *El Médico de su Honra*; and *El Mayor Monstruo los Zelos*, tragedies of passion. But in the opinion of many critics his sacred plays, *Autos Sacramentales* (6 vols.), contain his best work. His collected plays were first pub. at Madrid in 1682-91, and later eds. have been issued there in

1848-50 and 1882. The best ed. of the *Autos* is that issued at Madrid in 1759-60. There is a Ger. trans. by Lorinser (1882) and E. trans. of different plays by Denis Ma. (1853-73), Edward Fitzgerald (1853 et seq.), Archbishop Trench (1856), and N. Maccoll (1888). See E. Cotarelo y Mori, *Ensayo sobre la vida y obras de D. Pedro Calderón*, 1924; A. Valbuena Prat, *Calderón: su personalidad, su arte dramático, su estilo y sus obras*, 1941; A. A. Parker, *The Allegorical Drama of Calderón*, 1943; E. Frutos Cortés, *Calderón de la Barca*, 1949.

Calderwood, David (1575-1650), Presbyterian minister and historian, b. Dalkeith, Midlothian. He was educ. at Edinburgh Univ., and became minister of Crailing, Roxburghshire (1604). He opposed the designs of James VI to introduce Episcopacy into Scotland, and was tried before the Scottish Parliament and banished. He lived in Holland from 1619 to 1625, where he wrote extensively on controversial subjects, and on his return to Scotland he collected material for his *History of the Kirk of Scotland*, 1678. He also wrote *Allare Damascenum*, 1621, and took part in drawing up the *Directory for Public Worship in Scotland*. See life by T. Thomson prefixed to the *History*, printed by the Woodrow Society, 1842-5.

Calderwood, Henry (1829-97), minister and philosopher, educ. at Edinburgh Univ. and Theological Hall of the United Presbyterian Church. He was appointed examiner in philosophy, Glasgow, 1861; prof. of moral philosophy, Edinburgh, 1868, and chairman of the first school board of that city, 1873-7; author of *The Philosophy of the Infinite*, 1854, *The Revelations of Mind and Brain*, 1877, and *Evolution and Man's Place in Nature*, 1893. See life by his son, W. Calderwood, and D. Woodside, 1900.

Caldes, is. (area 449 ac.) of Pembrokeshire, S. Wales, 2½ m. S. of Tenby, in Carnarvon Bay, property of a Cistercian priory which came here in 1929 from Belgium. There is a lighthouse on the S. cliffs.

Caldicot, tn. of Monmouthshire, Wales, 6 m. SW. of Chepstow. The ruined castle, largely 12th cent. and originally moated, is particularly impressive. C. is a development area for Chepstow, and a country college is planned here. Pop. 3000.

Caldwell, Anne, see MARSH, Mrs.

Caldwell, Erskine Preston (1903-), Amer. novelist, b. Coweta co., Georgia. After a year at the univ. of Virginia he became a reporter on the *Atlanta Journal*. He first became famous with his novel *Tobacco Road*, 1932, which was made into a play which had the longest run in the hist. of the Amer. theatre. Others of his novels are *God's Little Acre*, 1933, *Journeymen*, 1935, *Trouble in July*, 1940, *Tragic Ground*, 1944, *House in the Up-lands*, 1946, *This Very Earth*, 1948, *A Lamp for Nightfall*, 1952, and *Love and Money*, 1954.

Caldwell, Robert (1814-91), Anglican coadjutor Bishop of Madras, b. near

Antrim. He was sent out to India by the London Missionary Society, but joined the Church of England. Ordained in 1841, he went to Tinnevely where he laboured for 50 years being consecrated Bishop of Tinnevely as coadjutor to the Bishop of Madras in 1877. He wrote a *Comparative Grammar of the Dravidian or S. Indian Family of Languages*, 1856, and assisted in a Tamil trans. of the Prayer Book, 1842-72, and the Bible, 1858-69. See his *Reminiscences*, 1894.

Caleb, son of Jephunnah, of the tribe of Judah, one of the spies sent by Moses

the Orange Free State and Basutoland. Length 220 m.

Caledonia, Rom. name for that part of Scotland lying N. of the firths of Clyde and Forth, still used in poetry for the whole of Scotland.

Caledonian Canal, chain of lochs, united by artificial canals, which stretch NE. and NW. across Scotland, connecting the N. with the Irish Sea. It traverses the Great Glen of Albin, through the counties of Inverness and Argyll, from Moray Firth to Loch Eil. The lochs are Ness, Oich, Lochy, Eil, and Linluche. The total



A. J. Bowland

A VALLEY IN THE MALUTI MOUNTAINS ALONG THE CALEDON RIVER, SOUTH AFRICA

to explore Canaan. Ten of the spies acknowledged that the land 'flowed with milk and honey,' but declared that the cities were well protected and that the people were of giant-like proportions. But two of them, C. and Joshua, were anxious to fight their way to Canaan. As a reward they were spared to enter the promised land. C. received Hebron and its dist. as his portion.

Caledon: 1. Tn in Cape Province, S. Africa, 72 m. by road SE. of Cape Town. It is on the Zwartberg, and has 7 thermal springs, strongly radio-active, whose content of ferrous carbonate held in solution is declared to be 4 times as great as that of any other springs known. Pop.: Whites, 2164; Coloureds, 1535; Bantu, 141.

2. Riv. of S. Africa rising in Mont-aux Sources in the Drakensberg and flowing into the Orange R., forming for the greater part of its course the boundary between

length of the canal is nearly 62 m., the canals being 23 m. long. The work of cutting these channels was begun in 1803, under the supervision of Telford. The canal was opened for navigation in 1823, but the work was not completed till 1847. The average depth of the artificial channels is 17 ft, the breadth at the surface being 120 ft, and at the bottom 50 ft. The total cost of construction was £1,311,270. The canal enables vessels to avoid the dangerous route via Pentland Firth and the Hebrides, and is chiefly used by fishing craft.

Caledonian Market (officially the Metropolitan Cattle Market, the successor of the Islington Cattle Market), former market in the bor. of Islington, London. It was inaugurated, together with a general market, in 1855, and situated on the famous Copenhagen Fields (q.v.). The cattle market was closed in 1929.

and the general market, a popular resort of 'bargain hunters,' in 1939.

Caledonian Orogeny, the period of mt-building which affected parts of what is now NW. Europe, E. America, Greenland, and Arctic during early Palaeozoic (q.v.) times. Named after the anct name for Scotland, Caledonia, to commemorate the Scottish mts formed at this time. These include the Grampians, the N. Highlands, and the S. Uplands, the geological structure of which largely dates from the C. O., though later earth movements have repeatedly affected the ground and determined the shape of the present-day relief. The prevailing NE. to SW. grain of much of the country in Scotland, Wales, and N. and W. Ireland dates from this period of mt-building. The Caledonian chain can be traced northwards through the Shetlands into W. and N. Norway and into the Arctic Is. of Spitsbergen and Bear Is. Its effects can be detected in E. Greenland where a mt chain running parallel to the coast can be recognised, though in a deeply dissected condition. In N. America Caledonian structures run from Newfoundland towards the St Lawrence, where they are again recognised and may be followed to the state of New York. In all these countries the Caledonian chain consists of folded and often metamorphosed sediments, originally deposited in late pre-Cambrian or early Palaeozoic times, together with igneous rocks intruded before or during the earth movements which occurred at intervals from the Ordovician to the Devonian. The Caledonian mt system of Europe gave rise to the anct continent known geologically as the Old Red Northland, which occupied most of NW. Europe of the present day and which came into being during the Devonian. Parts of that continent in Scotland and in Scandinavia have remained above sea level as dry land continuously until the present. See also ALPINE OROGENY; GEOLOGY; HERCYNIAN OROGENY; MOUNTAIN-BUILDING PERIOD.

Caledonian Railway. The company was formed in 1845, amalgamated and absorbed the Scottish Central and Scottish NE. railways, together with a number of small lines which served tns N. of Perth in 1865-6, and obtained possession of the Perth and Clyde Canal and the Monkland Canal in 1867. The total length of line was 1080½ m. The main lines ran from Carlisle to Aberdeen via Stirling and Perth, Edinburgh to Glasgow, Greenock, and Gourock, and to Oban and Ballachulish. The railway was amalgamated in 1923, together with numerous other national and local lines, with the L.M.S. Since 1 Jan. 1948, the Scottish railways so amalgamated have been organised as the Scottish region of the Brit. Railways system.

Calembour, or **Calembourg**, play upon words, based upon the difference in meaning of words pronounced alike, in great favour among the Fr. wits of the 18th cent. The name is said to be derived from an abbot of Kahlenberg, an amusing personage, or a teller of amusing anecdotes,

in old Ger. tales, or possibly from a count of Kahlenberg, who was notorious for the amusing blunders in speaking French at the court of Louis XV.

Calenberg, or **Kalenberg**, former Ger. principality. In the Middle Ages it belonged to Lüneburg, and after descending from one branch of the House of Brunswick to another, it came in 1705 into the possession of the elector of Hanover (q.v.). The principality was traversed by the Rs. Weser and Leine. Area 1050 sq. m.

Calendar. The C. now in general use is the Julian, with the Gregorian correction (see METROLOGY). The Romans developed a C. of alternate 29- and 30-day months with an arbitrary intercalated period to keep the civil and solar years in step, but abuse by the pontiffs responsible for the correct operation of this system led to an accumulated discrepancy of about 2 months by the time Julius Caesar became dictator and determined on reform. Sosigenes (of whom little is known beyond Pliny's reference) gave technical advice, and the year 46 bc was extended to 445 days in order to restore the vernal equinox to 25 Mar. The first Julian year began on 1 Jan. 45 bc (700 AUC). (See CHRONOLOGY.) Originally this system provided leap year with alternate 31- and 30-day months, Feb. being reduced to 29 days in the intervening years, but the Emperor Augustus transferred one of these to his own month (Aug.) in order to make it equal to Julius Caesar's July. Then the last 4 months had their days re-allocated in order to avoid 3 31-day months in succession. The Julian correction was not exact and the cumulative error became measurable in days as the cents. passed: in order to eliminate this discrepancy Pope Gregory XIII ruled that 5 Oct. should be called 15 Oct. in the year 1582. This change took effect immediately in Italy, France, Spain, and Portugal; sev. other Rom. Catholic countries came into line on the new 1 Jan. 1583, but the Protestant states of Germany, the Netherlands, and Denmark did not change until 1700. In the Brit. Isles, dominions, and N. Amer. colonies the new style C. was not in use until 3 Sept. became 15 Sept. in accordance with the provisions of the Calendar Act (24 Geo II c. 23) passed in the previous year (see A. E. Berriman, *Historical Metrology*, 1953). In France an attempt was made by the revolution to establish 22 Sept 1792 as the beginning of a new official era (see CHRONOLOGY), and this was accompanied by a complete reconstruction of the C. on the basis of 12 30-day months with 5 named holidays to complete the year, and a sixth (to be called Revolution Day) every fourth year. All this was cancelled by Napoleon's decree in 1806. There is a modern attempt to arouse interest in a rationalised J. based on 4 equal quarters of 13 weeks with 'Worldsday' between the end of one year and the beginning of the next, plus a leap-year holiday between June and July. Under this scheme there would be 31 days in the first months of

each quarter. Relevant literature can be obtained from World Calendar, 20 Buckingham St, London S.W.1.

Hebrew Calendar. The Jewish day begins nominally with the sunset but actually at 6 p.m.; its length is 24 hrs, but each hr is divided into 1080 *halagim*, the duration of the *helaq* being 3.3 sec. New Year's Day is 1 Tishri (which falls between 5 Sept. and 5 Oct.), and the ordinary year contains 12 months of alternate 30- and 29-day periods making a total of 354 days, but 7 times in each cycle of 19 years there is an intercalated month Veadar of 30 days between the sixth month Adar and the seventh month Nisan: this makes the embolismic year of 384 days required to readjust the Jewish to the solar year.

Muslim calendar. The year is composed of 12 lunar months containing 30 and 29 days alternately (total 354), but in a cycle of 30 years there are 11 in which the last month of the year has an extra day. The year begins in the month called Muharram; the ninth month, Ramadan, is observed as the month of abstinence. See also CHRONOLOGY and HOROLOGY.

Calendering, process of producing a glazed or polished surface upon paper, linen, and cotton. The term is a corruption of 'cylindering,' having reference to the usual method of passing the material between revolving cylinders, usually of steel or hydraulically compressed paper, under high pressure. The principles are illustrated by the domestic iron and mangle.

Calends, or **Kalends**, the first day of any month in the Rom. calendar. See CALENDAR.

Calendula, genus of plants of the family Compositae, common to the Mediterranean. *C. officinalis* is well known in England as the pot-marigold, Mary-bud, or golds, and is a very hardy garden plant. *C. arvensis*, the field marigold, grows profusely in vineyards of the Rhine.

Calenius, Walter (d. 1151), archdeacon of Oxford from 1115 to 1138. The name C. was given to him by John Bale, it being an adjective formed from *Calena*, a supposed name for Oxford (really a mis-reading for Caleva, the name of a Rom. station at Silchester). According to Geoffrey of Monmouth, this Walter brought from Brittany the Breton or Welsh original which Geoffrey professed to translate in his *History of the Kings of Britain*.

Calepino, Ambrogio (c. 1440-1510), It. humanistic scholar. His original name was Ambrogio of the Counts of Caleppio (Bergamo, N. Italy). He compiled a Lat.-It. dictionary, which appeared in Reggio Emilia in 1502; later he revised and amplified it to include also English, French, German, and other languages. This work became the prototype of similar compilations, later known as *calepini*. The latest revised ed. of Calepino's work was by Iacopo Faccioliati (q.v.); it appeared in 1772.

Calif. see CATTLE.

Calgary, city founded in 1883, in the prov. of Alberta, Canada, the centre of a

branching and agric. dist. It is an important junction on the main line of the Canadian Pacific Railway, 40 m. from the Rocky Mts whence it obtains a supply of coal; the railway here rises to 3437 ft above sea level. C. is the home of the famous C. Stampede held annually in July. It has an institute of technology and art; there is a branch of the univ. of Alberta, giving courses leading to a degree of Bachelor of Education, and a public library of approximately 132,000 vols. C. has 2 daily newspapers and 3 radio stations. Industries are meat packing, malting, saw-mills, petroleum products, and dairy products; there is an active stock exchange. Pop. 168,840.

Calhoun, John Caldwell (1782-1850), Amer. statesman, b. Abbeville co., S. Carolina, of Scotch-Irish parentage. He graduated at Yale in 1804, and then entered the legal profession. In 1811 he represented his native state in Congress, and strongly supported measures which led to the declaration of war with England (1812-15). He was secretary of war in Monroe's Cabinet (1817), and twice became vice-president of the U.S.A., in 1825-9 and 1829-32. In 1829 he showed that his political views were undergoing a change, and in 1831, in his *Address to the People of South Carolina*, he definitely severed his connection with President Jackson, by setting forth his theory of state rights as opposed to federal rule. He retired from the vice-presidency and sat in the Senate from 1832 till 1844, when he became secretary of state under Tyler. C. strongly opposed war with Mexico (1846-7) and championed the slave-holding states (1848), honestly believing slavery to be a blessing to master and slave alike. He d. at Washington. For his life consult R. S. Jenkins, 1851, and R. K. Cralle, in the collected ed. of his works (1851-5); for his political and social views, and for the hist. of his time, consult the life by Von Holst, 1882. His *Correspondence* was pub. by J. F. Jameson in 1900.

Call, city, cap. of Valle del Cauca dept., Colombia, the fourth largest city of Colombia, situated on the Rio Cauca, at its junction with the Rio Cauca, at an elevation of 3140 ft. It is a prosperous and important commercial centre, and contains the fine Ionic church of San Francisco. The city centre and barracks were severely damaged by explosions of unknown origin on 7 Aug 1956. Pop. 88,370, largely Negro and mulatto.

Calibration, originally the accurate measurement of the bore ('calibre') of a cannon, but now applied to testing of the accuracy of any instrument. Laboratory and workshop instruments are compared with a sub-standard, e.g. a voltmeter is connected in parallel with the sub-standard on a variable voltage supply, the voltage being increased step by step from 0 to maximum and then decreased to 0 to account for sluggishness in action. The deviations in readings of the ordinary voltmeter from the sub-standard are tabulated as 'corrections' to be applied in use. A sub-standard is calibrated

against a standard which is usually kept in a separate room screened from interference of any kind from outside. The standard itself is calibrated independently of any instrument of the same kind, by reference to the fundamental definition of the unit of the quantity measured, e.g. an ammeter may be checked against a volt-ammeter measurement of amperes (q.v.) or by the Kelvin balance (q.v.).

Calibre, see GUN.

Caliche, impure sodium nitrate, or Chile saltpetre. Formula NaNO_3 . It is from C. that the world's supply of sodium nitrate is obtained. The deposits occur only in N. Chile, notably in the prov. of Tarapaca.

Calico-printing, process of impressing on cotton or other textiles certain designs in colours. The art was known to the Egyptians, even as far as the effect of certain substances called mordants in making the colours permanent in the fabric. It was also known in quite ancient times in India, whence, through the agency of the Dutch E. India Co., the trade was brought into Holland. It was introduced into London in 1676, Glasgow in 1738, and into Liverpool in 1764. The essential principles of the methods have remained the same, but the development of the use of machinery and the extension of chemical knowledge have made the operations less tedious and more varied in their colour effects. There are 2 main processes of printing: block-printing and machine-printing. In the former a wooden block is engraved with the design by hand, exceptionally fine work sometimes being done on copper plates let into the wood. The design for machine-printing is first of all engraved upon a soft steel roller, which is hardened and made to impress the design in relief on a second steel cylinder. This cylinder is hardened in its turn and finally transfers the original design to a copper roller. Each colour to be printed demands a separate roller, so that machines carrying as many as 20 copper cylinders may be employed. Each printing cylinder is mounted so as to press against a large central roller, around which the cloth to be printed passes. The colour is supplied to each copper cylinder by a colour-box in which a small roller revolves up to its axis, at the same time pressing against the copper cylinder. The 'colour doctor,' a thin steel blade fitting against the surface of the copper cylinder before contact with the cloth, removes excess of colouring matter; while another steel blade, called the 'lint doctor,' is similarly fitted after the printing cylinder leaves the cloth to remove all impurities communicated by the cloth. There are many 'styles,' or methods, of colour printing. In the 'madder style,' for example, a cloth may be printed with 4 or more different mordants in the printing machine. Mordants may be defined as substances which have an affinity for the fabric on the one hand and an affinity for the colouring material on the other; they thus serve to hold the colouring matter in place. After being dried in a drying chamber, the pieces are put through a process called

aging. This consists of subjecting them to the influence of heat and moisture, by which certain necessary physical and chemical changes in the printed mordants are brought about. The next process, called *dunging*, consists of passing the cloth through a hot solution which removes any uncombined mordant or thickening agent. A solution of cows' dung was formerly used for this process, but many effective substitutes have been discovered. The material after being thoroughly washed is ready for dyeing, a process usually occupying 1 or 2 hrs. The material then has to be 'cleared,' that is, the colour has to be taken out of those portions not mordanted. This is done by means of a hot soap solution and a chlorine solution, all colours not 'fixed' being thus removed. In colouring with indigo or aniline black, it is customary to print a 'resist,' that is, a substance which prevents the incorporation of the colour material with the fabric; the coloured portion will then ultimately be that portion not treated with the resist. Steam is used with some colouring substances either to fix them in the fabric by mere mechanical blowing through, or to effect a desired chemical change, or, when albumen is used as a fixing agent, to bring about the required coagulation. See C. O'Brien, *Calico Printing*, 1892, and W. Watson, *Textile Design and Colour*, 1937.

Callout, see KOZHIKODE.

Calli, see CALIPH.

California, Pacific state of the U.S.A., bounded N. by Oregon, E. by Nevada, S.E. by Arizona, S. by Lower C. (Mexico), and W. by the Pacific Ocean. It lies between parallels 32° 28' and 42° N. lat. It is popularly known as the Golden State, and in the W. it is often spoken of as the Coast. The vast mt system of C., with the variation it gives of peak and canyon, valley and hill, is one of its most conspicuous features. Two great mt ranges exist. The Sierra Nevada runs almost parallel with the coast along the E. boundary of the state. Its average breadth is about 80 m., and it includes about a dozen peaks over 10,000 ft high. Chief of these is Mt Whitney (14,995 ft), the highest in the U.S.A. (excluding Alaska). Among the Sierra Nevada ranges are the rifts of the Yosemite, Kings, and Tuolumne, canyons famous throughout the world for their magnificent scenery. Along the coast lies the series of disconnected ranges grouped as the coast range, longer but lower than the Sierra Nevada. Between these 2 ranges lies the great Central Valley of the Sacramento and the San Joaquin, which 2 rvs. unite and run into San Francisco Bay. The former, with its trib. the Feather, drains the N. part of the state, the latter drains most of the S. part. Other rvs. are the Eel, Trinity, and Klamath, all in the N. Since C. extends over 770 m. from N. to S., the climatic conditions are varied. The N. dist. is very rainy, particularly in the winter, and the NW. is damp and foggy. The S., however, is warm and semi-tropical, and has

thus become a favourite winter resort. The rainfall is generally low, and the nights are generally cool throughout. On the whole, the climate is one of the best in the world. The flora of C. is very distinct from that of the more easterly states. Among its characteristic products may be named the mammoth *Sequoia gigantea* and the *S. sempervirens*, a species of redwood which flourishes particularly in the NW. These 2 species are the only survivors of the genus *Sequoia*, once widely spread over the N. hemisphere, and efforts are being made to preserve them. Timber production is valued at some 30 million dollars (2,000,000,000 board ft—chiefly pine). There are 18 national forests, which cover over 25 million ac. Of animals, the most characteristic are the grizzly and black bears, the puma, the bighorn sheep, and various varieties of deer. The N. rvs. supply good stores of salmon, and coast fishing is generally important. The geology of the state is fairly simple. The general basis is fairly recent, the Sierra Nevada being chiefly composed of Triassic and Jurassic beds; the coast ranges are chiefly Cretaceous and Tertiary. The axis of the Sierra Nevada is probably Archean, and the elevation of the coast range occurred towards the end of the Miocene period. The mineral resources are great, and since the discovery of gold in 1848 the output has been enormous. C. produces, commercially, about 60 kinds of minerals: gold, silver, copper, lead, zinc, quick-silver, stone, borates, soda, potash, salt, pumice, clay, gypsum, chromite, silica, iron ore, manganese, platinum, molybdenum, tungsten, and magnesium. Mineral output annually ranges as high as 1 billion dollars. The gradual increase in the number of small owners had given an impetus to C.'s agric. progress. Thirty-six million ac. are under cultivation; C.'s fruit crop ranks first nationally, and C.'s wineries make 90 per cent of domestic wines and brandies. In 1951 C. produced the second largest barley crop, 42,360,000 bushels, and 1,770,000 bales of cotton lint. On 1 Jan. 1952 the state had 3,160,000 head of cattle, including 849,000 milch cows valued at an average of \$300 per head. Manufacturing is the state's major industry, with the value in 1951 of \$6,145,000,000. Transportation equipment ranks first, and includes aeroplanes, autos, and ships, followed by food products, fabricated metal products, lumber and petroleum products, primary metals, and electrical equipment. C.'s output of crude petroleum products in 1951 was 354,467,000 barrels of 42 gals. each. The cash income from crops annually is 2 billion dollars. Abundant irrigation is provided by numerous streams and unnavigable rvs. The great Central Valley project (including Shasta and Friant dams), the All-American Canal, Imperial and Parker dams in the Colorado, the Los Angeles Aqueduct (233 m. long), tapping Owens R., and Colorado R. Aqueduct (242 m. long) are among the major projects. Six million ac. of land are under irrigation. The largest cities

and chief seaports (q.v.) are Los Angeles, San Francisco, Stockton, Oakland, Long Beach, Sacramento, and San Diego. In 1950 the total of commerce in the San Francisco Bay area alone amounted to 37,081,559 tons. About 40 per cent of U.S. commercial fish catch is landed in C. ports. S. C. continues its world leadership in motion pictures. Communications by road, railway, and air have been tremendously accelerated in the last decade, more than 100 million dollars having been spent on highways alone. The state administration is in the hands of a governor elected every 4 years. The Senate consists of 40 members elected every 4 years and the assembly of 80 members elected for 2 years. C. is represented in Congress by 2 senators and 30 representatives. It was first discovered by Juan Cabrillo in 1542, and remained under Sp. rule until 1822, when it declared its independence and its allegiance to Mexico. It was taken over by the U.S.A. in 1847, and became a state of the Union in 1850. Its area includes 156,803 sq. m. of land and 158,693 sq. m. of inland waters; its 1950 pop. was 10,586,223. Sacramento is the state cap. See A. Drury, *California: an Intimate Guide*, 1939; J. W. Caughey, *California*, 1940; J. A. B. Scherer, *Thirty-First Star*, 1942; R. E. Cowan, *A Bibliography of the History of California, 1520-1930* (3 vols.), 1943; R. G. Cleland, *From Wilderness to Empire*, 1944.

California, Gulf of, arm of the Pacific which separates the Lower California peninsula from the rest of Mexico. Length is about 700 m., and breadth varies from 50 to 150 m.; area 82,500 sq. m. It was originally known as the Sea of Cortés, after its first explorer. Both shores are bordered by high mts, and the coastline is very varied. At its N. extremity it receives the Colorado R., and various other rvs. also run into it from the mainland of Mexico. The chief ports are La Paz, Guaymas, and Mazatlán. It is noted for deep-sea fishing.

California, Lower, narrow and drought-stricken peninsula of Mexico, separating the Gulf of California from the Pacific Ocean; area 55,634 sq. m. It is nearly destitute of streams and exceedingly arid. It is divided into 2 parts: N. Ter. (pop. 226,870) and S. Ter. (pop. 60,500). The Boleo copper-mines in the N. have rich resources. Deposits of gold have been discovered and a solid int of iron and various other minerals. The chief tn is La Paz (q.v.).

California, University of, opened in 1869, has been at Berkeley since 1873. The architecture of the campus is Fr. Renaissance, designed by Emile Benard. In 1956 it had expanded to 7 other campuses at Davis, Goleta (Santa Barbara College), La Jolla (Scripps Institution of Oceanography), Los Angeles, Mt Hamilton (Lick Observatory), Riverside, and San Francisco. It has colleges of letters and science, agriculture, applied arts, architecture, engineering, and pharmacy, and schools of business administration, criminology, education, forestry, law,

librarianship, medicine, nursing, optometry, public health, social welfare, and veterinary medicine. At Berkeley is a radiation laboratory, with a bevatron activated in 1954. The univ. of C. operates the Los Alamos Scientific Laboratory, in New Mexico. Each campus has its library. At Los Angeles were 1,000,000 vols. in 1954; at Berkeley 1,900,000, including the Bancroft Library (100,000 items of W. Americana and colonial Lat. Americana) and many other special collections. Teaching staff in 1955 (all campi), 5300; students, 40,300.

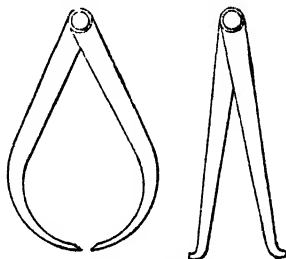
Californian Poppy, *Eschscholtzia californica*, ann. species, family Papaveraceae, with many varieties, native to NW. America, and grown as an ornamental plant for its many brilliant colour forms.

Caligula (AD 12-41), Rom. emperor, b. Actium, son of Germanicus and Agrippina. His real name was Gaius Caesar; but as a child he spent much time among the legions on the Rhine, wearing a diminutive pair of soldier's boots (*caligae*), and was therefore nicknamed C. ('bootkins') by the troops. He succeeded Tiberius in 37, and, thanks to his liberality and the illustrious reputation of his father, was at first immensely popular. Eight months after his accession, however, he was stricken with an illness that undoubtedly affected his mind; for thereafter he behaved as a sanguinary and licentious madman. His extravagance exhausted Rome, and indeed the whole of Italy; he built a temple to himself as Jupiter Latiaris, and even threatened to erect his own statue in the Holy of Holies at Jerusalem. In 39 BC he led what was no better than a plundering expedition into Gaul; but 4 months after his return he was assassinated, together with his wife and daughter. See J. P. V. D. Balldon, *The Emperor Gaius*, 1934.

Calipers, instrument resembling a compass with bent legs, and used for measuring the diameters of various objects. It is used for finding the correct measurement of bores and shafts.

Caliph, **Calif** (from the Arabian *kalifa* or *khalifah*, meaning successor), title given to head of Mohammedanism (see ISLAM). The name caliphate denotes the rank, dominion, or office of a C. Each C. was supposed to be a direct lineal descendant of Mohammed. After Mohammed d. this title was first borne by Abu-Bekr, who was elected Mohammed's 'representative.' The hist. of these rulers can be divided into 3 divs.: (a) The first 4 C.s who immediately succeeded Mohammed; (b) the Ommayad C.s; and (c) the Abbasid C.s. Abu-Bekr was the friend and father-in-law of Mohammed, and he proved himself capable and vigorous, considerably extending the limits of Islam. In the war that he carried on against the Persians, the Muslims were unsuccessful at first, but at last, at the battle of Qadisiya, the Persians were defeated and had to give up part of their land and limit themselves to Iraq proper. The Muslims under Abu-Bekr had soon annexed all the lands

bordering on Arabia, and to these they added Egypt. Abu-Bekr d. in 634, and was succeeded by Omar, during whose reign there were further tremendous conquests. Othman succeeded Omar (644) in the caliphate; he was a weak ruler, and the gov. of Islam fell into the hands of the Korish nobility. Othman was murdered in 656, and after much controversy Ali was elected as successor to Othman. His caliphate was disturbed by continual feuds, and in the end Ali was murdered also, in Jan. 661. Moawiya (661-80) was the first ruler under the new Ommayad dynasty, which derived its name from one of Moawiya's ancestors. Their seat was Damascus. Many fights and battles took place during his rule. He was essentially a statesman, but he was deeply religious as well, as he followed closely the precepts of Islam.



CALIPERS

None of his successors, however, had his virtues. Moawiya's son, Yazid I (680-3), succeeded. During his reign he committed three actions for which Muslims never pardoned his memory: the murder of Hosain (grandson of the prophet), who had refused to take the oath of allegiance to Yazid, and who had led a revolt of the people of Iraq and sustained defeat and capture at the battle in the plain of Kerbela opposite Kufa (AD 680); the pillage of Medina, whose people had espoused the cause of Abdullah ibn Zobair, a rival for the caliphate, who had himself proclaimed C. at Mecca (AD 682-3); and the taking of the Kaaba (Ka'aba) (q.v.). Yazid was followed by his eldest son, Moawiya II (683-4), a young man of weak character, who d. of the plague or through being poisoned. The choice of a successor then fell on Merwan bin al-Hakam, at Damascus, a descendant of Ommayya, who ruled as Merwan I (684-5). After a brief reign spent in unceasing warfare with the Shi'ites, he was suffocated by his wife and succeeded by his son, Abd al-Melik, whose turbulent reign lasted till 705. He gave the caliphate a coinage of its own, and also gave his patronage to scholars, and urged them to translate Persian works into Arabic. In the year 692 he levied a capitation tax on all Christian men. This was a means of getting money with which to support his wars. The next C.

was Walid I (705-15), under whom the caliphate was greatly extended, stretching to Spain on the one side and to the mouth of the Indus on the other. Suleiman, who d. in 717, was followed by a good ruler, Omar II, but he was poisoned in 720. Yazid II next succeeded, and d. in 724. Hisham d. in 743. Walid II was slain in a rebellion in 744. Yazid III d. also in 744. Ibrahim was dethroned (744) by Merwan II, then governor of Armenia. He was the last of the Ommayyads. They were not popular, and at last 3 brothers, descendants of Abbas, an uncle of the prophet, rose in rebellion. Merwan was pursued into Egypt, and killed in battle in 750. Abdullah, an uncle of the claimants, sent an invitation for a feast to 80 Ommayyads in Damascus, and when they were assembled killed them all. Abul Abbas (750-4) was the first C. under the Abbasids' regime. He was called also Saffah, meaning shedder of his enemies' blood. He was followed by Abu Ja'far Almansur, his brother (754-75), who made Bagdad the seat of empire. He left behind him vast riches, but his son, Almahdi (775-85), and his grandson, Alhadi (785-8), spent most of it extravagantly. Alhadi's brother, Haroun al-Raschid (the Just) came next (786-809). He is best known from his patronage of literary men. He persecuted the Christians, and made 8 separate attacks on the Gk empire in Asia Minor. His 3 sons fought for supremacy instead of accepting their father's div. of the empire. Amin was defeated and slain in 813, and his brother Almamun succeeded him (813-33). Motassim followed his brother (833-42), but with him departed the glory of the caliphate under the Abbasids. He was afraid of his own subjects, so he left Bagdad and went to Samarra, and gathered under his nominal leadership about 50,000 Turks, who soon had all the power in their hands. Ever after the C.s held power and life by the sanction of the Turks. The Bagdad caliphate was finally overthrown in 1258. A puppet caliphate continued in Egypt, however, under Mameluke domination until its conquest by the Turks, 1516-17. In 1520 the last puppet C. surrendered his office to Solymun I (q.v.) and the title was then borne by Turkish sultans until 1922, when it was made elective in the Turkish imperial family. But in March 1924 the Turkish parliament decided to abolish the Turkish caliphate completely, and the members of the house of Osman were then expelled from Turkey, while Komal (see ATATURK) was re-elected president of the Turkish Rep. See W. Muir, *Annals of the Early Caliphate*, 1883; T. W. Arnold, *The Caliphate*, 1924.

Calippus, Gk astronomer, fl. at the beginning of the 4th cent. bc. He observed that the Metonic Cycle contained an error of the fourth of a day, and introduced a 940 lunations period which is equal to 27,758.75 days. See GOLDEN NUMBER and METON.

Calixtus, or **Callistus**, name of 3 Popes: **Calixtus I** (217-22), successor of Zephyrinus. His life is known chiefly from

the accounts of Hippolytus a schismatical adversary of his. This writer says that C. was a slave, denounced as a Christian by the Jews, and later associate of Pope Zephyrinus. Hippolytus accused him of favouring the Patristic views and of lax discipline. The cemetery on the Via Appia bears his name.

Calixtus II (1119-24), prior to becoming Pope was Archbishop of Vienne in France. He ruled during the struggles over the investiture question and the schism of the anti-Pope, Gregory VIII. He commenced negotiations on the former question with the Emperor Henry V, and after some trouble matters were settled by the Concordat of Worms, 1122.

Calixtus III (1455-8), Alfonso de Borgia, a Spaniard. He preached a crusade against the Turks, who had just taken Constantinople (1453). His chief work was the vindication of the memory of Joan of Arc. The same title, C. III, was also borne by one of the anti-Popes, whom Frederick Barbarossa, the emperor, set up in 1168 in opposition to Alexander III.

Calixtus, Georg, properly Callisen (1586-1656), Ger. Protestant theologian. b. Medelhye in Schleswig. From 1613 as prof. of theology at Holmstedt, he was engaged in keen controversy with the Catholics. His study of the first cents. inclined him to advocate toleration, and this brought him into some suspicion. His chief work is *Epitome theologiae moralis*, 1634.

Calla, genus of Araceae with the single species, *C. palustris*, Bog Arum, found in marshes of N. Europe. The leaves are cordate, and the hermaphrodite flowers, borne every 2 years, are enveloped in a beautiful white spathe. C. Lilies are now classed under *Zantedeschia* (q.v.).

Callaghan, Sir George Astley (1852-1920), Brit. admiral. Entered the navy, 1865, and by 1894 had reached the position of naval adviser to the Inspector-general of fortifications. In 1900 he commanded the *Endymion* in Chinese waters, taking part in the suppression of the Boxer rebellion. Also fought at Taku and later commanded the naval brigade which co-operated in the relief of the Peking legations. Promoted rear-admiral in the Channel Fleet when the 'Dreadnought' type was introduced and in 1911 became Commander-in-Chief, which post he held till the outbreak of the First World War, when he was succeeded by Adm. Jellicoe. It was due largely to his recognised skill in training organisation that the home fleet was in so high a state of efficiency when he retired.

Callahan, James Morton (1864-), prof. of hist. and political science at W. Virginia Univ. Head of the dept of hist. and political science, W. Virginia Univ., 1902; dean, College of Arts and Sciences, same univ., 1916. Among his works are *Neutrality of the American Lakes*, 1898, *Confederate Diplomacy*, 1901, *American Relations in the Pacific and the Far East*, 1901, *The American Expansion Policy*, 1903, *Semi-centennial History of West Virginia*, 1914, and *History of West Virginia, Old and New*, 1933.

Callaite, see **TURQUOISE**.

Callan, tn of Kilkenny, Rep. of Ireland, 10 m. SW. of Kilkenny; pop. about 1600 (1954).

Callander, police burgh in Perthshire, Scotland, on the R. Teith, 16 m. NW. of Stirling. It is the recognised H.Q. for visiting the Trossachs (q.v.), and a popular and picturesque holiday resort. Pop. 1800.

Callanish, or **Callernish**, dist. and vil. on Lewis Is., Ross and Cromarty, Scotland, on the E. shore of Loch Roag, 16 m. W. of Stornoway. The standing stones

Callcott, Sir Augustus Wall (1779-1844), landscape painter, b. Kensington. He early studied music and was for sev. years a chorister at Westminster Abbey. In 1799 he turned to painting and in 1810 was elected R.A. In 1837 he received knighthood. His best works are landscapes, though he attempted large figure compositions such as his 'Raphael and the Fornarina.'

Callendar, Hugh Longbourne (1863-1930), physicist, b. Hatherop, Glos. Educ. at Marlborough and Cambridge Univ. Prof. of physics at McGill Univ.,



Violet Banks

MAIN CIRCLE OF THE STANDING STONES OF CALLANISH
(Stones are in the form of a cross.)

of C., comprising an avenue or alignment of parallel stones culminating at the one end in a circle intersected by a cross (the alignment forming one arm of the cross), are among the finest in Britain, and date from the Neolithic period. Pop. 162.

Callao (Sp. El Callao), city, naval arsenal, and chief seaport of Peru, 6 m. SW. of Lima. It is situated on C. Bay, where it is sheltered from storms by the Is. of San Lorenzo. It has a floating dock, fine harbour walls, and narrow streets of shabby appearance. It has gasworks, sugar refineries, iron-works, etc., and its chief exports are minerals, sugar, hides, wool, etc. The present tn dates only from 1746, when the old city was destroyed by a great earthquake. It suffered considerably from bombardment in the war of the Pacific, 1879. Pop. (dept) 114,000; (city, 1950 estimate), 84,000.

Canada, 1893-8, at Univ. College, London, 1898-1902; and later at the Imperial College of Science. He carried out much research work in thermodynamics, notably in calorimetry. He devised a constant pressure air thermometer which could measure up to 450° C. with an accuracy of 0.1° C. In 1894 he was elected F.R.S., and received the Rumford medal in 1906. His *Callendar Steam Tables*, 1915, and *Properties of Steam and Thermodynamic Theory*, 1921, give the results of his researches on steam.

Callernish, see **CALLANISH**.

Calles, Plutarco Elías (1887-), Mexican military leader and statesman, b. Guaymas, Sonora, Mexico. Joined in the rebellion against the rule of the tyrant-president, Porfirio Díaz. He was on the side of Carranza (q.v.) in the latter's fight with Huerta (q.v.), reaching the rank of a general. In 1915 he campaigned with Gen. Obregón (q.v.) against Pancho

Villa. In 1917 he was made governor of his native state of Sonora. After holding Cabinet posts under Carranza and Obregón he was elected president of the Mexican rep. for a 4-year term, beginning in 1924. His administration was marked by very stormy times. The oil-land laws brought a conflict with the big Amer. petroleum companies, and the laws for separation of Church and State resulted in a conflict with the Rom. Catholic Church.

Callianassa, genus of decapod crustaceans, and is the type of the family Callinassidae. They are noted for the inequality in size and form of the chelae, or claws. *C. subterranea*, the commonest species, is found at Naples and on Fr. and Eng. shores.

Callias, member of a wealthy Athenian family who were hereditary torchbearers at the Eleusinia mysteries. C. fought at Marathon (490), and after the accession of Artaxerxes I (464) he went on an embassy to the Persian court. This mission was supposed by some anc. authors to have resulted in a so-called 'Peace of Callias'; but the evidence, to say the least, is inconclusive. On his return C. was accused of treason and fined 50 talents. His grandson of the same name was the real negotiator of another 'Peace of Callias' in 371 B.C.

Callicarpa, genus of deciduous and evergreen shrubs, family Verbenaceae, about 40 species, some of which are grown in gardens for their autumn foliage colour and fruits.

Callicera, generic name of certain dipterous insects of the family Syrphidae. They are stoutish flies with large heads and eyes, the body is silky, and the antennae form elongated and slightly curved clubs.

Callischema, genus of Coleoptera of the family Cerambycidae, or longicorns. It differs from allied beetles in having the maxillary palpi smaller than the labial, and shorter than the terminal lobe of the maxillae. It emits a very agreeable odour.

Callichthys, genus of fishes belonging to the Siluroidea, or catfish suborder. The body and head are protected by large, hard, scaly plates, only the snout and under surface being naked, and barbels depend from the mouth. The species frequent rivers and streams in hot climates, and when the water dries up they perform journeys overland in quest of new ponds.

Calliocrates, Gk architect who, with Ictinus, designed the Parthenon (q.v.). He also designed the small temple of Niké Apteros at Athens.

Calliocrates, Spartan general, was sent in the year 406 B.C. to take Lysander's place as commandant of the fleet, towards the end of the Peloponnesian war. He pursued Conon, and defeated him in the harbour of Mitylene. Conon took refuge here, and held out till the Athenians sent a large force to his relief. C. was then defeated and slain in the naval battle of Arginusae. C. was greatly hampered in his efforts for efficiency by the incapacity of his predecessors.

Callidium, genus of coleopterous insects

of the Cerambycidae, or longicorns. *C. bagulus* is a Brit. species, about three-quarters of an inch long, of dull black colour, and is very destructive to fir-trees.

Calligonum, genus of Polygonaceae which consists of about 100 species from Africa and Asia. *C. aphyllum* yields a nutritious gum, which is obtained from the root, and a beverage is made from the fruit; and it is grown as a botanical curiosity.

Calligraphy, see WRITING.

Callimachus, Athenian sculptor, who fl. in the 5th cent. B.C. He was possibly a disciple of Calamis (q.v.); over-refinement has been ascribed to his work. He is supposed to have invented the Corinthian capital, and also to have been the first to employ the running borer for drilling marble. Among other decorations furnished by him for the Erechtheum (q.v.) was a famous golden lamp.

Callimachus (c. 305-c. 240 B.C.), Gk grammarian, critic, and poet, b. Cyrene. He founded a school at Alexandria, where Eratosthenes, Aristophanes of Byzantium, and Apollonius Rhodius (qq.v.) were among his pupils. From about 260 until his death C. was employed as a cataloguer in the museum library. Chief among his prose writings (now lost) was *Pimakes*, a catalogue of authors and their works with short critical notices. Of his poetry, only 6 hymns and 64 epigrams remain entire. These have been ed., with trans., by A. W. Mair, 1929.

Callimorpha, genus of Lepidoptera of the family Arctiidae; it includes several beautiful night-flying moths. The body is small and the wings large, somewhat triangular, and the hinder margins are rounded. *C. jacobaeae*, the pink underwing, is a common example.

Callim-hare, see FIKA.

Callington, murr. tn. of Cornwall, England, 10 m. from Launceston. It has extensive quarries, granite from which was used for the construction of the Thames Embankment, and Blackfriars and Battersea bridges, London. Pop. 2300.

Callionymus, technical name of the percormorph fishes known popularly as dragonets. The gill openings are reduced to a single small hole near the nape of the neck, the ventral fins are under the throat, the fin-rays of mature males are produced into filaments, and the body is smooth and without scales. *C. draco*, the sculpin, is about 10 in. long, and is brown and white in colour; *C. lyra*, the gemmeous dragonet, is another Brit. species, and is yellow, sapphire, and violet in hue.

Calliope, mother of Orpheus and the goddess of epic poetry. See MUSES.

Callirrhoe, famous fountain of Athens, one of the chief water supplies. In Gk legend C. was the daughter of Achelous, the riv. god.

Callisen, Georg., see CALIXTUS, GEORG.

Callistemon, genus of Australian shrubs or small trees, family Myrtaceae, 12 species; esteemed in gardens for their long brushes of many-stemmed flowers.

Callistephus, monotypic genus of *C. chinensis*, the China Aster (q.v.).

Callisthenes (c. 360–328 BC), of Olynthus, Gk philosopher and historian, kinsman and pupil of Aristotle, accompanied Alexander the Great into Asia. He was put to death on account of his remonstrances against Alexander's oriental luxury and assumption of divine origin. He is credited with an account of Alexander's expedition and a hist. of the Phocian war, but the life of Alexander, once ascribed to him, is certainly spurious. The romance of Alexander in its different versions is derived directly or indirectly from the Gk original which went under the false name of C., and this original was the foundation of the legends of Alexander circulated in the Middle Ages. This romantic life seems to date from the era of the Ptolemies, and its author, called the pseudo-Callisthenes, otherwise Aisopos, has been variously identified—but without much evidence—with Aristotle, Antisthenes, and others.

Callisthenes, light gymnastic exercises for health and the development of the body. See GYMNASTICS.

Callistratus: 1. Rom. jurist, who lived in the reigns of Septimius Severus and Caracalla. None of his complete works is extant, but some extracts occur in the *Digest* of Justinian.

2. (4th cent. BC), Athenian orator and general, whose eloquence impelled Demosthenes to study oratory. In 361 BC he was condemned to death for having advised the Thebans to occupy Oropus. Whereupon he fled to Methone in Macedonia, but was executed on his return to Athens in 355 BC.

3. Gk grammarian of the 2nd cent. BC, author of commentaries on the chief Gk poets. He is said to have been the first to introduce the 24-letter alphabet to the Samians.

4. Gk rhetorician of the 3rd cent. BC, author of descriptions of 14 statues by famous artists.

Callitrichaceae, family of dicotyledonous plants, of about 25 species, of the single genus *Callitriche*. They are nearly all floating plants, and are cosmopolitan but for S. Africa; in Britain they are known as water starwort. The flowers are unisexual and devoid of all floral covering, the male flower being simply a single stamen and the female a bilocular, spuriously quadrilocular, ovary with 2 styles. In *C. verna* pollination takes place in the air, in *C. autumnalis* under water.

Callosity, thickening of the epidermis into a horny layer in parts exposed to pressure or friction. Most commonly found on soles of feet and palms of hands of manual workers. C.s may be distinguished from corns (q.v.) by the absence of the central stem or core present in the latter. C.s are usually painless.

Callot, Jacques (1593–1635), Fr. painter and engraver, was b. Nancy, Lorraine. At the age of 12 he ran away from home, intending to seek Rome and devote himself to art. He joined a band of gipsies, and later the suite of a nobleman. He worked in Florence (1612–21), but quitted

this to serve with the Duke of Lorraine. He visited the Low Countries to gather the material for his 'Siege of Breda,' and later Louis XIII of France engaged him to engrave other war pictures, among which is the 'Siege of La Rochelle.' C., the great student of manners, has left a vast number of etchings and drawings. He was rapid and impatient in his work, and all his prints are marked by vigour and animation. His 'Gipsy Halt' and 'Miseries of War' are particularly remarkable in this respect. See Lieure, *Jacques Callot*, 1927, and R. A. Weigert, *Jacques Callot*, 1935.

Calluna vulgaris constitutes in itself a genus of Ericaceae, and is known as ling heather; it flourishes on every heath of Britain, and is common in N. America and Europe. The plant is a low-tufted shrub, with small, sessile, closely imbricated leaves, flowers varying in colour from deep red to white, and fruit a septidial capsule.

Callus, substance given off round the fractured ends of a bone forming new bone which unites the breakage. A similar process takes place in plants when a cutting is taken or a branch pruned. When a plant is damaged a succulent tissue exudes and covers up the cut surface. In cuttings this C. produces the roots of the young plants.

Calmar, see KALMAR.

Calmet, Augustin (1672–1757), learned Fr. Benedictine monk, b. Meunil-la-Horgne, near Commercy (Moselle). He entered the Benedictine order in 1689. In 1713 he was appointed abbot of St Léopold at Nancy, and 10 years later was transferred to the abbey of Senones. In 1728 he produced the *Histoire ecclésiastique et civile de la Lorraine*, characterised by great learning and research. His *Dictionnaire historique, géographique, chronologique et littéraire de la Bible* (4 vols.), 1722–8, is one of the first works of its kind. Another important production is the *Commentaire sur tous les livres de l'Ancien et du Nouveau Testament*, (23 vols.), 1707–16. See the life by Dom Fange, 1763.

Calmette, Gaston (1858–1914), Fr. journalist, b. Montpellier. Educ. at lycées of Brost, Bordeaux, Clermont-Ferrand, and Mâcon, he joined the staff of the *Figaro* in 1880, was secretary of the editorial board, 1894–1903, and thenceforward editor-in-chief. A chevalier of the Legion of Honour, he acquired riches and strong enmity through the *Figaro*, for Chauchard, who had been prin. shareholder, left him a large part of his wealth; and he was unhesitating in his attacks on personal character. When editor of the *Figaro*, he published letters which compromised Mme Caillaux (see CAILLAUX). His murder by Mme Caillaux at his office on 16 Mar. was the social sensation of the year 1914. Mme Caillaux was arrested but, after a trial at which she was defended by her husband, was acquitted.

Calmette, Léon Charles Albert (1863–1933), Fr. bacteriologist, b. Nice, brother

of Gaston C. (q.v.). Became a director of the Pasteur Institute and one of the leaders of medical research in France. Spent most of his life in the study of tuberculosis, his researches resulting in the introduction of the Bacille Calmette-Guérin (B.C.G.), which has proved successful in the prophylaxis of young children against tuberculosis. See life by N. Bernard and L. Nègre, 1939.

Calms, the, see DOLDRUMS.

Calmuks, see KALMYKS.

Calne, bor. and mkt. tn. of Wilts, Eng-land, 5 m. ESE. of Chippenham. It has a large bacon-curing industry, and manufs. of flour and paper. In the 10th cent. C. was the site of a palace of the W. Saxon kings, and in 978, at a synod held here, the floor gave way, precipitating all but St Dunstan to the ground. Pop. 4000.

Calochortus, Mariposa Lily, or Star Tulip, Amer. genus of Liliaceae, nearly allied to the fritillary and tulip; the fruit is a septicidal capsule. The plants are abundant in California, but do not grow well in England unless their roots are carefully protected from frost and excessive water, and can be exposed freely to light and air when growing. *C. albus* is a white, and *C. lilacinus* a lilac-coloured, species.

Calomel, popular and medical name for mercurous chloride, Hg₂Cl₂. This substance is found in nature as horn mercury or horn quicksilver, a sectile tetragonal mineral of hardness 1 to 2 and sp. gr. 8.48. C. is prepared in the laboratory by adding mercury to sulphate of mercury and triturating the whole in a mortar, afterwards adding common salt and subliming the mixture. Any corrosive sublimate which passes over is removed by washing with hot water. A more convenient method is adding mercury to corrosive sublimate (mercuric chloride) and subliming. C. is a dense, white, odourless powder, insoluble in water; it turns black when treated with lime-water, potash, soda, or ammonia. When heated it vaporizes without charring and sublimes again unaltered. It is the most widely used preparation of mercury in medicine, producing its effects without much local inflammation. In small doses it is used to relieve congestion of any part of the alimentary system, as it gently stimulates secretion, and thus helps to 'clear the system' in cases where increased functional activity is required to counteract the effects of overfeeding, unaccustomed lack of exercise, etc. In larger doses it is used by adults as a purgative. C. is not so poisonous as the more soluble mercuric salts, but if retained in the intestinal tract for any length of time, or given continuously, it may give rise to mercury poisoning, characterised in severe cases by a coppery taste in the mouth, loosening of the teeth, and in the severer cases by emaciation, necrosis of the jaws, and neuritis. It has been suggested that calomel, given in the form of teething powders, may be the cause of pink disease in infants.

Calonne, Charles Alexandre de (1734-1802), Fr. statesman, b. Douai. He

became a lawyer, and in 1783, after Necker's dismissal, became comptroller-general of the Treasury. He found the deficit enormous, and in an effort to remedy affairs, he persuaded Louis XVI to call an assembly of the 'notables,' to whom he proposed that their privileges of exemption from taxation should be abolished. This was so badly received, that he was compelled to resign. He spent some years in England, but returned to die in France.

Calophyllum, genus of evergreen trees, family Guttiferaceae, is noted for the beautiful colour of its young leaves. The species grow in tropical countries, chiefly of the Old World. *C. inophyllum*, a native of the E. Indies, has large leaves like those of a water-lily, snow-white fragrant flowers, and a nut which yields an oil useful for burning in lamps. *C. lacamahaca* yields the resin which is known as lacamahac. *C. calaba*, the calabab-tree, grows in the Caribbee Is. and is noted for its white, sweet-scented flowers, green fruit with an oily seed, and timber which is used in making staves and cask-headings.

Calore, see VOLTURNO.

Calorescence, name given by Tyndall to the production of light from the invisible rays beyond the red end of the spectrum (q.v.). These rays are heat-rays, and magnesium can be burned and platinum brought to white heat by them. The action of the platinum renders the rays visible, whence the description 'calorescent.' See INFRA-RED RAYS.

Caloric Theory, now discarded theory of heat, which postulated a fluid 'caloric' of no weight, the presence of which rendered a body hot. It was believed that 'caloric' flowed from a hot to a cold body when they were placed in contact. The theory was replaced by the kinetic theory, following the researches of Count Rumford (see THOMPSON, SIR BENJAMIN) in 1798. See THERMODYNAMICS.

Calorie, unit quantity of heat. The 'small C.' is the amount of heat required to raise the temp. of 1 gm. of water 1° C. As the specific heat of water varies slightly with its temp., the temp. is usually specified, as from 0° to 1°, or from 15° to 16° C. The latter temp. has the advantage that the C. so measured is almost equal to the 'mean C.' obtained by dividing the amount of heat required to raise 1 gm. of water from 0° to 100° C. by 100. The 'great C.' is the amount of heat required to raise 1 kg. of water 1° C. It is therefore equal to 1000 small C.s, and is approximately equivalent to 3.968 Brit. thermal units. For the use of the term in reference to human energy see DIET and FOODS AND FEEDING. See also METROLOGY.

Calorimeter, apparatus used to measure quantities of heat developed or absorbed in different chemical and physical changes, e.g. heat developed by friction, combustion, etc.; or absorbed as by melting ice. C.s vary in form according to the purposes they serve. The simplest variety, a plain metal vessel, is that used to determine the specific heat of metals. In the

ice-C. the heat is measured by the amount of ice which it melts. More complex forms are used to determine the specific heats of gases. In these experiments many contrivances, such as vacuum jackets, non-conducting air jackets, are used to prevent loss of heat, which is the greatest difficulty to overcome. See SPECIFIC HEAT and THERMOCHEMISTRY.

Calosoma, genus of coleopterous insects, is included in the family Carabidae. They greatly resemble the genus *Carabus*, and *C. scyphantha* is one of the largest and most beautiful species of its family.

Calotropis, genus of Asclepiadaceae common to the tropics of Asia and Africa. *C. gigantea*, the madar, mudar, wara, or bow-string hemp, grows in sandy places in many parts of India, and is noted for its milky juice, which is used medicinally in the E.; for the fibre made from the bark and the floss obtained from the seeds, *C. procera* is known as Fr. cotton or Fr. iasmine.

Calotistes, satirical society founded by Aymon and Torsac, two of Louis XIV's bodyguard, in 1702. It derived its name from *calotte*, the small cap that the priests wore to hide their tonsure. Various attempts were made to suppress it. In the middle of the 18th cent. it was converted into a military institution, but it was finally abolished at the time of the revolution.

Calotype, process of photography invented by Fox Talbot in 1841, in which paper sensitised with silver iodide and silver gallo-nitrate was exposed wet in the camera and then developed in silver gallo-nitrate in excess gallic acid; the resulting image was negative, i.e. reversed as regards light and shade.

Calovius, Abraham (1612-86), Ger. Lutheran divine, b. on 16 April, at Mohrungen, Prussia; studied at Königsberg, and in 1650 became prof. of theology at Wittenberg, and later on general superintendent and primarius. He was the most ardent upholder of Lutheranism in the 17th cent. He strenuously resisted Catholics, Calvinists, and Socinians, and was particularly opposed to the reconciliation policy, or 'syncretism,' of Georg Calixtus. As a polemical writer he had few rivals. He wrote his *Systema locorum theologicorum* between 1655 and 1677 in 12 vols. His *Historia Syncretistica*, written in 1682, was suppressed.

Calpe, ancient name of Gibraltar (q.v.). See HERCULES, PILLARS OF.

Calprenède, Gautier de Costes de La, see LA CALPRENÈDE.

Calpurnia, third wife of Julius Caesar. She was daughter of L. Calpurnius Piso (consul 58 BC), and was married in c. 59. C. tried to dissuade Caesar from going to the senate house on the Ides of March; after his murder she transferred his money and papers to Mark Antony's house.

Calpurnius Siculus, Titus (1st cent. AD), Lat. poet, author of 7 *Elogues* which, though lacking in originality and sometimes marred by extravagance, are the work of a skilled literary craftsman. Four of these elegies have been attributed by some critics to Nemesianus

(q.v.); but the latter, whilst indebted to C. S., shows a higher degree of poetic genius. See J. W. and A. M. Duff, *Minor Latin Poets* (with trans.), Loeb Library, 1934.

Calshot, headland of Hants, England, at the W. extremity of Southampton Water, now an important seaplane base.

Calstock, par. and mining tn, E. Cornwall, England, on the Tamar. Pop. 4400.

Calabellotta, tn in Sicily (q.v.), 27 m. NW. of Agrigento (q.v.). It was originally a Saracen (q.v.) fortress. The site of the ant. *Tricala* is near by. Pop. 9000.

Caltagirone, tn in Sicily (q.v.), 37 m. SW. of Catania (q.v.). It is built on hills, 2000 ft above sea level, near the source of the C. riv. In 1693 it was devastated in an earthquake. The tn has a cathedral, many fine villas, and is famous for its majolica and terra-cotta work. There is a school of ceramics. Pop. 43,900.

Caltanissetta: 1. Prov. of Italy, in central Sicily (q.v.). It rises to a height of 3000 ft in the N., and has many high valleys of the Salso, Platani, and other small rvs. The chief products are sulphur, cereals, wine, salt, olives, and other fruits. The prin. tns include C. and San Cataldo (qq.v.). Area 812 sq. m.; pop. 308,000.

2. (anc. Nissa) Tn in Sicily, cap. of the prov. of C., 58 m. SE. of Palermo (q.v.). It stands on a high plateau, almost in the centre of the is., and was severely damaged during the Second World War. It has a ruined castle and a baroque cathedral (16th-17th cents.). The tn is the centre of the Sicilian sulphur-mining industry, and has mining schools and an agric. market. Pop. 60,500.

Caltha, genus of perennial herbs, about 16 species, family Ranunculaceae, natives of temperate and cold parts of the N. hemisphere. *C. palustris* and *minor* are native in Britain. Flowers are regular, petal-less, with all parts spirally arranged; calyx of 5 or more yellow or white sepals; stamens many; and the fruit a group of follicles.

Calton Hill, hill overlooking Edinburgh (q.v.) from the E., 355 ft high. On the summit is the National Monument.

Caltrap (A.-S. *calca-traeppe*), a small obstacle made of 3 or more sharp iron spikes joined together. They were much used in the warfare of the Middle Ages. When an enemy was expected, the ground over which it was to travel was thickly strewn with them. The result was disastrous to the horses as well as to the barefooted infantry. The word is also applied to plants that catch the feet, the 'water C.'s' being the name of the *Potamogeton* because it entangles swimmers.

Calumba Root, or Radix Calumba, is obtained from the climbing herbaceous plant, *Jateorrhiza calumba*, family Menispermaceae, occurring in Mozambique. The odour is faintly aromatic, the taste bitter and slightly acid, and the bitter active principle is known as calumbine. It is used medicinally as a tonic and stomachic.

Calumet tobacco pipe known among Amer. Indians as the peace pipe. This

was always handed round at an assembly of warriors at the conclusion of peace negotiations or other important ceremonies. In these days it is offered to strangers as a mark of hospitality. Dire offence would be taken should they decline to smoke it. The pipe has a long stem of wood, usually with a stone bowl, and is ornamented with women's hair or eagles' feathers.

Calumet City, residential city in NE. Illinois, U.S.A., manufacturing chemicals, packed meat, and pickles; incorporated 1911. Pop. 15,800.

Calvados, in Normandy, a maritime dept in the N. of France, and called by that name after one of the vessels of the Sp. Armada, which was shipwrecked off a dangerous ledge of rocks in 1588. The coast is dangerous on account of the rocks, and lighthouses are placed at the mouths of the R.s. Touques, Dives, Orne, and Vire. The region is mountainous with extensive fertile valleys. The pasturage is good, and there is an abundant supply of wheat and agric. produce. Cider is produced in great quantities from the orchards in the Auge dist.; a spirituous distillation of cider is made also and bears the name of the dept. There are 6 arrons., named respectively after the chief tns, Caen, Vire, Bayeux, Lisieux, Falaise, and Pont l'Évêque. The prin. ports are Caen, Trouville, and Honfleur, and there is an excellent fishing industry. Textile manufs. are important, and there are iron industries. Area 2198 sq. m.; pop. 405,000. For the battles in C. in 1944 see under WESTERN FRONT IN SECOND WORLD WAR, INVASION OF NORMANDY.

Calvaert, Denis (1540-1619), Flem. painter, b. Antwerp; went as a young man to Bologna and Rome; after studying Raphael's works, and assisting Lorenzo Sabbatini with paintings for the ducal palace, he returned to Bologna, where he founded a school which Domenichino and Guido both attended.

Calvary. The word C. is a Lat. trans. of the Gk for the Aramaic word *Golgotha*, or rather *Golgoltha*, a skull; the name *ras* (head) is still given to rocky eminences by the Arabs. The sites of C. and the Holy Sepulchre were providentially preserved by the erection of temples of Jupiter, Juno, and Venus, when Hadrian made Jerusalem a Rom. colony in AD 135; and for some 10 years from AD 325 Constantine levelled and embellished these sites and built the Church of the Holy Sepulchre to enclose them. This now lies inside the city walls, but excavations have proved that the site was originally outside, though later enclosed within it.

Calvary Clover, name given to the ann. *Medicago echinus* of S. France.

Calvatia, genus of fungi of the order Lycoperdales, rounded or pear-shaped, with tough peridium. *C. gigantea* is the Giant Puff-ball, found in woods, gardens, etc., growing up to 4 ft across, and edible. *C. coelata* and *C. saccata* are other Brit. species.

Calvé, Emma (Rosa Emma Calvert)

(1858-1942), Fr. opera singer, b. Décazeville, Aveyron. She studied music under Jules Puget in Paris and, after she had made her first important appearance, which was at Brussels, 1882, as Marguerite in *Faust*, she became a pupil of Mathilde Marchesi. She had a great range and could sing both contralto and soprano. She appeared at Covent Garden in 1892 as Santuzza in *Cavalleria Rusticana*, her success, both in that part and as Carmen in Bizet's opera, being immediate. It is generally agreed that she was the greatest of all Carmens. Strictly her voice was a mezzo-soprano, and through all the registers there was a timbre of remarkable beauty and individuality. She purchased the château of Cabrières, which became the home of her retirement, and there she founded and maintained a sanatorium for young girls.

Calveley, Sir Hugh (d. 1393), soldier. He fought in Brittany in the war of 1341-64, during which he was imprisoned at Josselin. He took part in the battle of Auray (1364), which ended the war. C. was a freelance and fought for whichever leader pleased him. In 1367 he left Henry of Trastamare and served the Black Prince, and fought under Sir John Chandos at the battle of Navarrete (1367). He became deputy-governor of Calais (1377-9) and of Brest (1380). He is said to have been one of the founders of a college in Rome (1380), and in 1385 founded one at Bunbury in Cheshire.

Calverley, Charles Stuart (1831-1884), poet and parodist, b. Martley in Worcs, son of a clergyman named Blayds, who changed his name to Calverley in 1852. Famous all his life for his ready repartees and improvisations and his pranks, young C. was educ. at Marlborough, Harrow, Balliol College, Oxford, and Christ's College, Cambridge. From Oxford he was sent down because of his escapades, but at Cambridge he was more staid and became a fellow. Having studied law, he was called to the Bar in 1865, but in the following year contracted concussion of the brain as the result of a skating accident, and was a semi-invalid till his death in middle age. He trans. the *Idylls of Theocritus* into Eng. verse, but is best remembered for the parodies, perhaps the cleverest in Eng. literature, contained in *Fly Leaves*, 1872.

Calvert, Mrs Charles (1836-1921), distinguished actress, daughter of James Biddles, an actor. She played as a child actress at the age of 7 with Charles Kean and wife, and became leading lady at the Theatre Royal, Southampton, in her teens; also acted at the Boston Theatre, U.S.A. During her husband's tenure of the Prince's Theatre, Manchester, she built up a reputation in Shakespearian parts such as Cleopatra, Hermione, Miranda, Catherine of Aragon—with Phelps as the cardinal. She was also successful in modern comedy, notably as Catherine Petkoff in Shaw's *Arms and the Man*, and as Mrs Hardcastle.

Calvert, Edward (c. 1803-83), painter and draughtsman, b. Cornwall, son of a naval officer. Was a midshipman, but

left the service to study the arts. Attended the Royal Academy schools and studied painting under Johns, a W. country artist. He was associated with Samuel Palmer (q.v.) as one of the admirers of Wm Blake; he stayed with Palmer at Shoreham in Kent, and the surviving works of this period, engraved and in water-colour, are of great beauty and interest. They include 'Christian Ploughing the last Furrow of Life,' the 'Cyder Feast,' and 'The Primitive City.' In later life he visited Greece and pursued to loss advantage an ideal of classic beauty. Paintings exhibited at the Academy were 'A Shepherdess,' 1827, 'Morning,' 1829, and Milton's 'Eve,' 1836. See memoir by Samuel Calvert, 1893.

Calvert, Frederick Grace (1819-73), chemist, b. London. He received his scientific education in France. His celebrity was gained from his researches into the industrial side of chem., tanning, calico-printing, and iron-puddling. He was the first person to manuf. pure carbolic acid, and founded extensive works in Manchester for its production as a disinfectant. Author of *Dyeing and Calico-printing* (2nd ed.), 1876.

Calvert, George, see BALTIMORE, 1st BARON.

Calvert, Louis (1859-1923), actor, son of an actor. Well known in Shakespearean parts, particularly as Falstaff in *Henry IV*. He was equally successful in many Shavian parts, his technique and flair for character being remarkable. Pub. *Problem of the Actor*, 1919.

Calvert, Thomas (1775-1840), theologian, b. Preston. He became tutor of St John's, Cambridge, 1814; Norrisian prof. of divinity, 1815-24; Lady Margaret's preacher, 1819-24. He was appointed king's preacher at Whitehall, and in 1822 was given the wardenship of the collegiate church at Manchester. See Raines, *Lives of the Wardens of Manchester*, 1885.

Calvi, seaport of NW. Corsica, on a peninsula in the Bay of C., 45 m. N. of Ajaccio (q.v.). It was founded in 1268, and was an important Genoese stronghold. During an Eng. bombardment of C. in 1794, Nelson (q.v.) lost his right eye. There are tourist and fishing industries, and a trade in fruit, oil, and cork. Pop. 2000.

Calvin, John (1509-64), b. Noyon. Picardy. Calvinus is the Latin form of Chauvin or Cauvin. His father, Gérard Chauvin, was notary apostolic and procurator fiscal of the co. of Noyon, and intended his son for the Church. In 1521 C. received the emoluments of cathedral chaplain at Noyon and later those of curé at Marteville. During this time he was studying at Paris in the colleges of Marche and Montaigu. It was then that he resolved not to take orders, and went to Orleans to study law. Here he found Pierre Olivétan, a kinsman of his, who was then busy translating some of the Scriptures, and induced C. to study them with him. Thence C. went to Bourges, where he met the famous Gk scholar, Melchior Wolmar (or Volmar) who further

influenced him in the direction of the reformed faith, though his conversion does not yet seem to have been definite. His residence at Bourges was cut short by the sudden death of his father. After a hurried visit to Paris he returned to Noyon, where he lived for 2 years. From 1529 to 1532 he apparently resided in Paris, lodging with a tradesman, Étienne de la Forge, an early victim of zeal for the Reformation whom C. accounted as a 'holy martyr blessed among believers.' In Paris he began to speak freely against the Church and its faith. Forewarned of an attempt to arrest him, C. retired first to a castle near Mantes, then to Saintonge and afterwards to Nerac, the residence of the queen of Navarre. Persecution was now so hot that C., giving up all his preferments, left the country and settled in Basel, where in 1535-6 he issued his epoch-making work, the *Christianae Religionis Institutio*, with its famous preface addressed to Francis I of France, in which the exile exhorts him to support the Reformation. It was written in Latin, and, 4 years later, trans. by C. himself into French. It is the first logical and complete definition and vindication of Protestantism. C. then made a short visit to Italy, where the new faith had made some headway, and he was well received by Renée, Duchess of Ferrara. He now paid a last visit to France, sold the paternal estates, and set out to settle in Switzerland. In 1536 he passed through Geneva, where Farel was striving hard to establish the reformed faith. This friend entreated him to remain and help in the work, but he was unwilling till Farel threatened him with the curse of God if he should neglect this clear duty. Then C. threw himself into the work with tremendous energy. A Confession of Faith was drawn up and approved by the people, and strict morality was enforced. But a reaction soon came against the strict rule of Farel and C., and the party known as the Libertines gained the upper hand. C. left the city and settled at Strasburg in 1539, where he married Idelette de Bure, a widow, but their 1 son d. in childhood. Meanwhile Geneva was finding that even C.'s strict rule was better than no rule, and in 1540 he was summoned to return. He was at first unwilling, for his life in Strasburg was an easy one. However, he considered that in Geneva duty lay, and in Sept. 1541 he re-entered the city. Here he devoted himself for the rest of his life to the task of ordering Geneva and the Protestant theology. He estab. the College of Pastors, and did his best to enforce a rigid morality. He also aided the reformed churches in all countries, corresponding with England, France, the Netherlands, Poland, etc. In 1559 he founded the academy of Geneva. His activity was prodigious till his death in 1564. During the first 14 years of his pastorate he was engaged in conflict with the Libertines, who were again his enemies. To the same period belong his 2 great controversies, with Sébastien Castellio, with Jérôme Bolsec, and, most memorably, with Michael Servetus (q.v.).

Servetus, a heretic whose views are fully explained in his *Restitutio Christianismi*, was arrested in France, and C. did his best to secure his condemnation. Servetus escaped and came to Geneva, whence C. had promised that he should not escape alive. After a scurrilous verbal conflict, the unfortunate man was tried and sentenced to be burnt. Though the great reformer did his utmost to get the manner of death altered, the sentence was carried out. That C. hated the doctrines which he found in his book is certain, but there is no evidence that he was actuated by personal spite and animosity against Servetus himself, though he took the initiative in bringing him to trial. The heresy of Servetus did not die with him, and the trials of sev. of his followers, with the conferences and controversies connected with them, occupied much of C.'s time for sev. years. In such controversies on points of faith, as, for example, with the Lutherans respecting the Lord's Supper, C. was for many years much troubled, and sometimes even endangered, by the opposition of the Libertine party in Geneva to his eccles. discipline there. But amidst these many cares and consultations on matters great and small, C. found time to write a number of works besides those provoked by the various controversies in which he was engaged; the most numerous were exegetical, though of course it is chiefly as a theologian and the head of a theological school that C. is now known. His incessant and exhausting labours told on so fragile a constitution racked by fever, asthma, gout, and stone. In 1564 his sufferings became so aggravated, that it was evident his life was rapidly drawing to a close. On 6 Feb. of that year he preached his last sermon, having with difficulty found breath enough to complete it. He expired in the arms of his faithful friend Beza on the evening of 27 May, in the 55th year of his age. See T. MacCrie, *The Early Years of Calvin*, 1880; H. F. Henderson, *Calvin in his Letters*, 1909; A. Monzies, *A Study of Calvin*, 1918; E. Doumergue, *Jean Calvin*, 1926-7; R. N. C. Hunt, *Calvin*, 1933; J. MacKinnon, *Calvin and the Reformation*, 1936.

Calvinism is distinguished chiefly by its dogma of Predestination. This says that God has destined certain souls to salvation, others to damnation, and that these decrees are unalterable. To the elect efficacious grace is sure to be given, and also the gift of perseverance. The Westminster Confession is the most complete exposition of C. It is estab. in the Reformed churches, in opposition to the Lutheran, of France, Scotland, Holland, etc. In England it inspired the Puritans and the numerous dissenting bodies. Thence it reached America. Dr Jowett thought Calvin 'the greatest commentator of the Scriptures that Europe had ever known.' Calvinists claim that it is a system of courageous consistency, and that 'the men who held it felt that they had their feet upon the last and highest reality.' It certainly inspired the Huguenots in France, the soldiers and citizens who, in

the swamps of Holland, resisted the tyranny of Catholic Spain, and the Eng. Puritans. For a modern statement of C. see H. Tyndeman Chivers, *Is there a Future for Calvinism?*; also bibliography for preceding article.

Calvinistic Methodist Church of Wales, the only Church of purely Welsh origin, is Calvinistic in doctrine and Presbyterian in organisation. Its adherents comprise a very large part of the Welsh-speaking pop., the number of communicants being 150,000. It owes its beginnings chiefly to the preaching of Howell Harris and others from 1735 onwards; later George Whitfield helped these men in their work. Connections between Eng. and Welsh Methodists ceased before 1750. The church is in federation with the Presbyterian Church of England, the United Free Church of Scotland, and the Presbyterian Church of Ireland; it is also a constituent of the Pan-Presbyterian Alliance. There are foreign missions in India, Assam, and elsewhere. It has about 1440 churches, and about 1610 chapels and buildings for Sunday schools and other purposes. In 1933 the Calvinistic Methodist or Presbyterian Church of Wales Act secured the autonomy of the Church in matters spiritual and the estab. of a properties board.

Calvinistic Methodists, see METHODISM. Calw, Ger. tn in the Land of Baden-Württemberg (q.v.), 22 m. W. by S. of Stuttgart (q.v.). It has a fine church (1400) and many ancient houses. Hermann Hesse (q.v.) was b. here. Pop. 7500.

Calycanthaceae, small family of dicotyledonous plants, containing 2 genera in China and N. America. The species are shrubs, which are usually aromatic and have square stems; the flowers have numerous sepaloid and petaloid perianth leaves, 5 to numerous stamens, numerous carpels, and an etaerio of achenes as fruit. The genus *Calycanthus*, or Carolina allspice, is represented by 4 species; *C. floridus*, common Carolina allspice, is a fragrant plant with chocolate-coloured flowers, and its bark is used as a substitute for cinnamon. The genus *Chimonanthus*, or Japanese allspice, has 2 species; *C. praecox* has lemon-coloured flowers which appear at a different season from the leaves.

Calycephyllum, small genus of Rubiaceae which contains 3 or 4 species, natives of the W. Indies and S. America. They are small, smooth trees with corymbs of flowers; in some cases the sepals are pink, and give the tree the colour of a rose.

Calydon, anct tn in Aetolia which, according to Pliny, was situated 7½ m. from the sea on the R. Evenus. It was supposed to have been founded by C., the son of Aetolus. The famous Calydonian boar, sent by Artemis to lay waste the fields, is said to have been hunted here by Meleager and other heroes. The walls of C. are sometimes said to be those of the Kastro of Kurtaga. They have a circuit of over 2 m., with 1 large gate and 6 little ones. Ruins of terrace walls outside the tn are thought to indicate the site where the temple of Artemis Laphria stood.

Calydonian Hunt, see MELEAGER.

Calymma, genus of coelenterate ctenophores of the order Tentaculata and family Calymmidae. The species, some of which are found near the equator in the S. Seas, have strongly compressed and little elevated bodies, and are furnished with tentacles. The term C. is also applied to the outer, vacuolated protoplasm of Radiolarians.

Calypsø: 1. Daughter of Atlas, inhabited the is. of Ogygia. Homer tells how Odysseus being wrecked on her isle, she treated him hospitably and promised him immortality if he would marry her. She held him for 7 years and bore him 2 sons, but finally his longing for home prevailed, and she d. of grief at his departure.

2. Name given to a form of folk music native to the W. Indies, the lyric being most usually concerned with political or social topicalities or with love. It is often sung extempore for the purpose of celebrating an event on the spot. It has been adopted into Amer. and W. dance music.

Calyptra (Gk *kaluptein*, to conceal), botanical name for the hood-like covering of plant organs of fructification, applied chiefly to mosses (*Musci*), in which it forms a membranous cap or lid to the upper part of the enlarged and ruptured spore-case or archegonium.

Calyptraea, cup-and-saucer limpet, is a genus of gastropod mollusc described by Lamarck. The species are numerous and widely diffused, and fossil species occur in the tertiary strata.

Calyptegia, genus of temperate and sub-tropical Convolvulaceae, consisting of lactescent, glabrous, twining, or prostrate herbs, with solitary one-flowered peduncles. *C. septum*, the larger bindweed, which grows in Brit. hedges, has 2 large bracteoles which invest the calyx, and is fertilised by a hawk-moth called *Sphinx convolvuli*. *C. soldanella*, the sea bindweed, is a native of European sea-coasts and some parts of Asia. The young stalks are sometimes pickled and the juice of the plant is cathartic.

Calyx, in botany, the outer whorl of floral leaves, each of which is called a *sepal* and is usually green, but may be coloured, or *petaloid*, e.g. monkshood. The sepals serve as a protective structure to the more important parts of the flower, and when coloured they attract insects. When they are separate from one another, the C. is *polysepalous*, e.g. in buttercup; when united, it is *gamosepalous*, e.g. in primrose. When the C. is below the gynoecium, it is said to be *inferior*; when above, it is *superior*. If the sepals fall off before the flower opens, the C. is *caducous*, e.g. poppy; if they fall off after the flower has opened, it is *deciduous*; if they remain until the fruit is ripe, it is *persistent*, e.g. violet. The C. is frequently quite inconspicuous and rudimentary, and in other cases it is represented by a *pappus* of hairs, e.g. dandelion; in the apple and pear it helps to form the fruit. In describing it fully, attention must be paid to the number of whorls, number of free sepals, or lobes of sepals, and to their

shape, of which the terminology is the same as that of leaves. The terms used for the general form of the C. are the same as those for the corolla, e.g. *spurred*, in 'nasturtium' (*Tropaeolum*), *paleate* in monkshood, *saccate* in wallflower. In some flowers, for instance, strawberry and geum, extra segments are present between the true sepals and constitute an epicalyx.

Cam (Cáo), Diogo, Portuguese navigator of the 15th cent., who continued the explorations of the African coast, begun by Prince Henry of Portugal. In 1482 he discovered the Congo, and afterwards explored the W. African coast to 22° S. lat.

Cam, riv, which rises in Ashwell, Herts, England, and flows 40 m. NW. and NE. through Cambs, and then into the Ouse, 3½ m. S. of Ely. It is joined at Grantchester by the Granta, which rises in Essex. It is navigable to the tn of Cambridge.

Cam-pha, coal-mining tn in the prov. of Quang-yen (q.v.), Tonking. There is a large open-cast coal-mine and docks, accessible to ships drawing up to 24 ft. at which coal is loaded. Antimony is also mined.

Camagüey, or Puerto Príncipe: 1. Prov. of E. Cuba, bounded on the W. by Santa Clara. It has an area of 10,172 sq. m. Its surface affords excellent pasturage and the chief industry is cattle-raising. Copper-mining is carried on. Pop. 618,376.

2. City of Cuba, cap. of the prov. of the same name. It is the third city of the is., and is situated 340 m. SE. of Havana, about 550 ft. above sea level. It has many ant. buildings, including the churches of La Merced and La Soledad. The first-named was built in the early 17th cent. by missionaries of Our Lady of Mercy. Its high altar of silver was made from 40,000 Sp. dollars. La Soledad was a 17th cent. hermitage. Camagüey is the centre of a cattle-raising dist. and exports (from Nuevitas, with which it is connected by rail) cattle, hides, and sugar. Airport. Pop. (city) 80,500; (urb. dist.) 204,254.

Camaleu, see CAMELO.

Camaldolenses, **Camaldolese**, also called **Camaldulians**, strict religious order whose founder was St Romuald, a Benedictine monk (c. 950-1027). The monks were divided into 2 classes, Coenobites and Eremites, and wore white garments. Their huts were built in the plain of Camaldoli, near Arezzo in the Apennines. As the order grew, so in time the collection of separate huts became grouped into a hamlet of cells with an abbot presiding; one common place of worship was instituted. Both Guido Grandi and Pope Gregory XIII belonged to this order. Camaldoli still flourishes.

Camalodunum, or **Camulodunum**, see COLCHESTER.

Camaracum, see CAMBRAI.

Camargue, La, is. in France, in the delta of the Rhône (q.v.), enclosed by the 2 prin. arms of the riv. About one-third of its area is lake or marshland, and the whole region would probably be inundated but for the dikes which have been constructed. Bulls and horses are reared on

the plains, and vines and rice are produced. Wildfowl are abundant. The mistral (q.v.) blows over the is. Area 150 sq. m.

Camarina, anct tn situated on the S. coast of Sicily. It was founded as a colony from Syracuse in 599 BC, and twice the people of Gela (q.v.) recolonised it, namely, in 492 or 496 BC and in 461 BC. It was destroyed 4 times: by the Syracusans in 552 BC (because it had thrown off its allegiance to the mother city), by the Carthaginians in 405 BC, by the Romans in 238 BC, and finally by the Saracens in AD 853.

Camassia, or **Quamash**, family Liliaceae, genus of N. Amer. bulbous plants, handsomely long racemes of flowers. *C. quamash*, Camass, has edible roots, once roasted by N. Amer. Indians; *C. leichlinii* is the finest species for gardens.

Cambacères, Jean Jacques Régis de (1753-1824), Fr. legislator who lived in the time of the Fr. Revolution. He was appointed member of National Convention in 1792, but was strongly opposed to bringing the king to trial. After the fall of Robespierre, he was made president of the Convention and president of the Committee of Public Safety (1794). C. was suspect on more than one occasion on account of his moderate views, and lost office for a time; appointed second consul under Napoleon, and subsequently created high chancellor of the empire, and Duke of Parma. He was partly instrumental in the compilation of the *Code Napoléon*. Upon the restoration of Louis XVIII he went into exile, but was recalled in 1818.

Cambay, tn of Bombay state, India, some 280 m. N. of Bombay, a former port for Ahmedabad (q.v.). About AD 1600 C. was a flourishing centre, and reference is made in *Hudibras*, 1674, to the 'Prince of Cambay,' one of the then ruling houses of Muslims. The port is of great antiquity and is described by an Arab traveller who visited it in AD 913. The harbour is now silted up and unimportant.

Camber, in engineering, an upward curve or convexity applied for a specific purpose. In roads it denotes the rise from the channel to the crown. Generally speaking, the rougher the surface the steeper the C., the purpose being to allow wet to run off into the channel. The rise is anything from 1 in 30 to 1 in 50—the latter for asphalt surfaces. In aeronautics C. is the degree of curvature of a wing or controlling surface. C. is also given to the decks of ships.

Camberley, dist. of Surrey, England, 7 m. from Ascot. The Army Staff College was built here in 1858.

Cambert, Robert (c. 1628-77), Fr. musical composer, b. Paris. He was musical director at the court of Anne of Austria, mother of Louis XIV. Associated with the Abbé Perrin, who had obtained a grant of monopoly for the performance of musical stage works in the Fr. language. C. composed the music for Perrin's *Pastorale*—claimed, though probably erroneously, to be the earliest Fr. comedy in music, or opera—performed at the Château d'Issy in 1639. Through the

performed in 1671 C.'s own opera *Pomone*, also unjustly claimed to be the first Fr. opera. With Perrin as librettist C.'s *Ariane* was rehearsed in Paris in 1669 but not performed. Lully's intrigues transferred Perrin's monopoly into his own hands, and C. was forced to go to England, where *Ariane* was at last performed in 1674, but possibly with new music by Grabu. *Pomone* was also given the same year. See also A. Pouglin, *Les Vrais Créateurs de l'opéra français*, 1881.

Camberwell, parl. and metropolitan bor. of London, situated immediately S. of the bor. of Southwark and Bermondsey. It includes the old vils. of C., Dulwich, and Peckham (qq.v.), much developed from c. 1820 onwards. George, Prince of Denmark, consort of Queen Anne, lived on C. Green (Denmark Hill is named after him), and so did Mendelssohn; Ruskin lived on Denmark Hill. Browning was b. in C. The industries include body building for cars, engineering, building, and book-binding. C. returns 2 members to Parliament. Area 4480 ac.; pop. 179,500.

Camberwell Beauty (*Vanessa antiopa*), large and beautiful butterfly, rare in Britain but common in central and S. Europe and N. America. The wings are a deep purplish-brown, with outer band of black and greyish-white or yellow border. The black band contains a row of large blue spots. In addition the two small wings have two small white spots. Formerly found occasionally at Camberwell, when that was a rural place.

Cambiasi, Luca (1527-85), Genoese painter, b. Monoglia in the Genoese state. At 15 he helped his father to paint subjects from Ovid's *Metamorphoses* on the front of a house in Genoa. He became a great friend of the artist Giambattista Castello, whose work closely resembled his own in character. In 1583 Philip II commissioned him to finish a series of frescoes begun by Castello in the Escorial. C. was very dexterous with his brush, and sometimes painted with one in each hand. His best works are at Genoa.

Cambium, strictly a single layer of cells among sev., known as the C. region, between the wood (xylem) and the bast (phloem) in stems and roots of Dicotyledons. It consists of flattened, prismatic cells, with thin cellulose walls, 4-sided and elongated, with the ability to divide repeatedly, each div. giving rise to an inner and outer cell, thus forming secondary wood and secondary bast, and also medullary rays, and so increasing the size of the plant. A special C., the phellogen (q.v.), is concerned in the formation of cork.

Cambodia, independent kingdom of SE. Asia. The name C. is European, being derived from the Hindu Kambuja, a name by which the Khmer ancestors of the present Cambodians were known.

Geography. The area of C. is 67,550 sq. m. and it is bounded on the N. and W. by Thailand, on the N. by Laos, on the E. by Viet Nam, and on the SW. by the Gulf of Siam. There are 2 marked features

in C. which largely determine the agriculture of the country and the activities of its people. These are the R. Mekong and the large lake Tonlé-Sap. The lake serves as a reservoir for receiving the overflow waters of the Mekong, which becomes greatly swollen by the rains and melted snow from the Tibetan range in the month of June. At this period the lake, which is fed by an arm of the R. Mekong called the Bras du Lac, attains to a depth of from 45 to 48 ft. overflows its banks, and inundates the country round over an area of 770 sq. m. Conversely, during the dry season, when there is a shrinkage

weaving of silk and cotton, pottery, and the making of rush mats. The exports are rice, salted pepper, maize, cotton, tobacco, kapok, resin, hides, and cattle. The chief towns are Phnom-Penh, the cap. (pop. 104,000), situated at the crossing of Tonlé-Sap and Mekong R.; Battambang, 180 m. further NW.; Kampot (92 m. from the cap.); and Kompong-Cham. There are 2 small sea harbours, Kep and Ream, both on the Gulf of Siam and connected to Bangkok by steamers, while a port of considerable size is now under construction with the aid of technical and



E.N.A.

MEKONG RIVER CRAFT AT PHNOM-PENH

of the waters of the Mekong, the Tonlé-Sap Lake also becomes greatly reduced in area, and its depth falls to an average of 5 ft. The whole of C. lies in the basin of the lower Mekong, which, entering this ter. on the N., flows S. for some distance, then inclines SW. as far as Phnom-Penh, where it spreads into a delta, and resumes a southerly course. Fishing forms the staple trade of C., for Tonlé-Sap supports a fishing pop. of over 30,000. The fish are caught by means of large nets at the end of the floods, and are either dried or fermented for nuoc-mam sauce. Next to fishing come the agric. products, and here rice is largely grown in the low-lying districts. Agric. products grown include the tobacco plant, coffee, cotton, pepper, indigo, maize, tea, silk, and rubber. The chief native activity is the salting and smoking of fish from the lakes. Cattle-breeding is also a flourishing native occupation. Other native industries are

financial assistance from the U.S.A. There are nearly 900 m. of waterways and 2000 m. of asphalt and macadamised roads, the chief roads being from Saigon to the frontier of Thailand, via Phnom-Penh and Battambang, from Phnom-Penh to the Gulf of Siam, from Saigon to Kratie and from Phnom-Penh to Angkor.

Climate. Much the same as that of Cochin-China, and varies with the monsoons. During the NE. monsoon, which lasts from mid Oct. to mid April, the weather is dry and warm, with a temp. ranging from 77° to 80° F. From mid April onwards until Oct. there is constant rain, and the temp. is considerably higher, sometimes reaching 95° F. Wild animals of all sorts abound, such as the elephant, rhinoceros, buffalo, tiger, panther, and leopard. Monkeys and rats are the plague of the dist., as they destroy the crops and agric. products. The pop. of C. numbers approximately 4,000,000.

The bulk of the inhab. are Khmers, but sizable minorities of Chinese and Vietnamese are found in the tns and centres of trade where they handle a large proportion of the commerce. Tribes of backward Moi peoples are found in the mt and forest areas, and small numbers of Malays and Thais have also settled in C. The Khmers are taller than their Vietnamese neighbours and have darker skin pigmentation. They lack the energy and the business acumen of the Vietnamese and Chinese, which is why these latter occupy such a prominent position in the commercial life of the country. Buddhism is the prin. religion, and Buddhist monks in saffron robes are everywhere in evidence. Most Cambodian men spend a period of their lives in a Buddhist monastery. Technically and educationally the Cambodians are backward, and for this reason there is a great shortage of doctors, engineers, economists, and the like. C. is still nominally ruled by a king, but the real political power is in the hands of the gov. which is formed from an elected Parliament.

History. The mighty monuments of Angkor (q.v.) provide an eloquent testimony to the greatness and power of the kingdoms of Fu-nan and Tchén-la, the forerunners of modern C. Centuries of pressure and attacks from the Thais in the W. and N. and from the Chams, later superseded by the Vietnamese, in the E. and N., sapped the strength of C. She accepted Fr. protection in 1863, and in 1884 signed an agreement with France establishing the political and administrative laws by which she would be governed as a Fr. protectorate. The border provs. of Siemreap, Battambang, and Sisophon were ceded to C. by Thailand in 1907, but were returned to Thailand in 1941 by Japan. During the Second World War C. was occupied by the Japanese. After the armistice the French once more assumed control of C., but it was not long before an anti-French nationalist movement known as Khmer-Issarak, inspired by the example of the Viet Minh (q.v.) in Viet Nam, began to wage a guerrilla war against the French. Their purpose was to regain Cambodian independence, and most Cambodians, including the young king Norodom Sihanouk, were in sympathy with this aim. This internal war dragged on until 1954 when, in accordance with the agreements reached at the Geneva Conference on Indo-China, an armistice was declared, the Fr. troops and administration withdrew, and C. became once more an independent state. King Norodom Sihanouk abdicated in favour of his father and himself took over the political leadership of the country. To-day C. enjoys full political independence and is a member of U.N.O. Considerable works of development are being carried out in C. with U.S. and Colombo Plan aid. See C. Robequain, *The Economic Development of French Indo-China* (trans. by I. A. Ward), 1944, and E. J. Hammer, *The Struggle for Indo-China, 1954* (and supplement).

Cambodia River, see Mékong.

Camboge, see GAMBOGE.

Cambon, Jules Martin (1845-1935), Fr. diplomat, b. Paris. A barrister, he held administrative posts in Algeria, 1874-8. He was Fr. ambas. in Washington, 1891; in Madrid, 1902. He was ambas. in Berlin when the First World War broke out, and in the Fr. Yellow Book he gave a searching analysis of Germany's relations with France during the 2 or 3 years preceding the war. He was secretary-general to the foreign ministry, 1915, and a signatory to the Versailles treaty.

Cambon, Pierre Paul (1843-1924), Fr. diplomat, b. Paris. He was called to the Bar, and was later secretary to Jules Ferry. C. was Fr. resident in Tunis, 1882; ambas. in Madrid, 1886; in Constantinople, 1891; and in London, 1898. He took an important part in establishing the Anglo-Fr. Entente.

Camborne, mrkt tn in Cornwall, England, 12 m. WSW. of Truro and 3 m. SW. of Redruth, the centre of a mining dist. Here is the School of Metalliferous Mining. Pop. of ward, 14,000; of urb. dist., 36,000.

Cambrai (anc. Camaracum), Fr. tn in the dept of Nord, at the junction of the Escaut and the St-Quentin canal. 37 m. SSE. of Lille (q.v.). It was once a tn of the Nervii. It became a bishopric in the 5th cent., and an archbishopric in 1559. The League of C. in 1508 united the Pope, the Emperor, and the Kings of France and Spain against Venice. By the *Paix des Dames* (Ladies' Peace) arranged here in 1529 between Louise of Savoy on behalf of Francis I. and Marguerite of Austria on behalf of the Emperor Charles V, France regained Burgundy but lost Flanders, Artois, and Milan. In 1793, during the Fr. Revolution the old cathedral was destroyed, and the bones of Fénelon (q.v.), who was once Archbishop of C., were ignominiously disturbed; a monument to him was erected in the new cathedral in 1825. The tn was taken by the Germans in 1914. It suffered severely in both world wars. There are sev. churches of interest, an anc. gate, a 12th-18th-cent campanile (229 ft high), an archiepiscopal palace, and a notable art gallery. There are cambrie (q.v.), lace, chicory, flour, beer, soap, iron, and sugar industries. Pop. 26,000.

Cambrai, battle of (north France). Two battles took place round C. in the First World War: (1) In 1917 the Germans were heavily pressing the Italians, and with a view to relieving this pressure, by preventing further Ger. divs. being taken from the W. front, a Brit. offensive against C. was planned, to be undertaken by the Third Army under Gen. Byng. Gen. von Marwitz was opposed to him. In place of the usual bombardment, which had hitherto announced the attacker's intentions, an enormous number of tanks was employed to destroy minor obstructions such as barbed-wire entanglements and machine-gun posts. The surprise nature of the attack proved to be the main feature contributing to success. The attack was launched on 20 Nov. 1917, with successful initial results, but the

Germans heavily and persistently counter-attacked at Bourlon Wood (q.v.), which was ultimately abandoned before C. was taken. (2) The great Brit. final offensive against the Germans began in Aug 1918, and to the Brit. First Army (to which a Canadian corps was added) under Gen. Horne was allotted the capture of C. The Canadians opened the attack on 26 Aug., and gained their first objectives, but as progress was made resistance became increasingly formidable as the Germans strengthened their rear lines. Resistance was first met in the Scarpe valley. Protecting C. to the NW. was the Ger. Dro-court-Quéant line. This was attacked on 2 Sept. and after only 4 hours' fighting the whole of the line, with its supporting lines, was in Brit. hands. The Germans hastily withdrew their remaining troops in this area and prepared to make another stand behind the Canal du Nord, which held up the Brit. advance. So far 10 Brit. divs. had defeated 13 Ger. divs. with considerable loss to the enemy. On 27 Sept the Canal du Nord was crossed on a narrow strip where it happened to be dry, and hostile positions to the N. of C. were captured. The advance was continued the next day, and Fontaine Notre-Dame, to the SW. of C., was captured. C. was now gradually becoming enveloped, but violent Ger. counter-attacks compelled ground to be given up in one or two places. Both sides were becoming exhausted with the struggle, but neither weakened, and on 30 Sept another Brit. and Canadian advance carried the line beyond C. on the N. as far E. as the canal at Ramillies. By 1 Oct. all the suburbs of C. had fallen. Steady progress to the S. of C. was being made by the Third Army, which had also commenced its advance on 27 Sept. One of its important objectives was the spur which dominated the country about Marcoing; Ribecourt, just S. of this position, was taken early in the advance, and by the evening Brit. troops were in the neighbourhood of Marcoing. At this time the First and Third Armies were in contact at Fontaine Notre-Dame. The next day the advance was continued against great opposition, but by nightfall the Germans had been driven over the Scheldt Canal, and the Allies' troops were firmly estab. at Noyelles and Marcoing. On 29 Sept. some of the Third Army crossed the canal about Masnières, while further N. others crossed at Noyelles and Marcoing, thus pressing on C. from the S. Resistance now became stronger than ever, and the Germans were fighting with great stubbornness. Nevertheless the Brit. troops were gradually closing round the city. Further S. the Australian troops were attacking about Masnières, and on 3 Oct. had captured ground to the E. of it and on the 5th took Montbréhain. C. fell on the same day. This battle proved to be one of the sternest fought during the war. Throughout this great battle the Canadians under Gen. Currie fought with conspicuous bravery, and the success of the operations was due mainly to their extraordinary exertions.

Cambresis, anct. div. of the prov. of Flanders, which now forms the chief part of the dept. of Cambrai (France). The Bishop of Cambrai was the Count, later the Duke, of C.

Cambria, Lat. name of Wales, derived from the Celtic *Cymry*, and originally applied to both Wales and the Brit. kingdom of Strathclyde. The name also appears in the Cambrian Mts, Cumbria, and Cumberland.

Cambrian System (Lat. *Cambria*, Wales), geological name of the oldest Palaeozoic system of rocks. The Cambrian Period follows the Pre-Cambrian and is followed by the Ordovician (q.v.). The Cambrian beds are the oldest to contain a well-organised fauna, which includes trilobites, brachiopods, pteropods, worms, sponges, and corals. Cambrian times began with a widespread invasion of land by the sea. In the Brit. Is. Cambrian rocks consist mostly of sandstones and shales, now altered to quartzites and slates; these outcrop in N. and S. Wales, Shropshire, the Malvern Hills, and the Lake Dist. In the NW. Highlands C. limestones occur. All these deposits were laid down in seas occupying basins running from Britain northward to Scandinavia where Cambrian rocks are also preserved. Cambrian beds are known in central Europe (especially Bohemia); N. Africa (especially Morocco); W. and central France; the Appalachians, the Pacific coast of N. America and around the Canadian Shield; and in China.

Cambric, name given to fine white linen fabrics, originally manuf. at Cambrai in the Fr. dept. of Nord. Some of the best C.s are now manuf. in Switzerland, while Scottish C. is an imitation of real C., in which the linen is replaced by finely twisted cotton.

Cambridge, Adolphus Charles, 1st Marquess of (1868-1927), Brit. prince, b. Kensington Palace, eldest son of the Prince of Teck, whom he succeeded in 1900, and Princess Mary of C., and elder brother of Queen Mary (q.v.). C. saw service in the S. African war and in the First World War. He renounced his continental titles in 1917, assuming the name of C.

Cambridge, Adolphus Frederick, 1st Duke of (1774-1850), seventh son of George III. b. Buckingham (then Queen's) Palace. He served in the campaign of 1794-5, and was created Duke of C. in 1801, appointed field marshal in 1813, and was viceroy of Hanover from 1815 to 1836. One of his daughters was the mother of Queen Mary (q.v.), wife of George V.

Cambridge, George William Frederick Charles, 2nd Duke of (1819-1904), Brit. soldier, first cousin of Queen Victoria, b. Hanover, the only son of George III's seventh son, Adolphus Frederick. He was present at most of the engagements in the Crimean War. He was made field marshal in 1862, and held the position of Commander-in-Chief from 1856 to 1895. He married an actress, Miss Fairbrother, their children taking the name of Fitz-George.

Cambridge, Richard Owen (1717-1802),

poet, b. London. Educ. Eton and Oxford, he studied law at Lincoln's Inn. He lived as a country gentleman at Whitminster in Glos. and afterwards at Twickenham, where he had many notabilities among his guests. He wrote the *Scribleriad*, 1751, a mock-heroic poem satirising false poetical taste, and also pub. some imitations of Horace.

Cambridge, municipal and parl. bor., city, and co. tn of Cambs, England, 56 m. N. of London, and 76 m. NE. of Oxford. The tn lies in a level plain, on the S. edge of the Fen country, and to its position here it probably owes its development, for the position of the hills around makes it the natural starting-point in crossing the Fens from the midlands. That its importance was early recognised is shown by its antiquity. There are probably anct Brit. remains in Castle Hill; 2 Rom. roads cross here; the tower of St Benet's Church is one of the finest pieces of Saxon work in the country, and its importance in Norman times is well known, while the church of the Holy Sepulchre is the oldest of the 4 round churches in England. The univ. (see CAMBRIDGE UNIVERSITY) is one of the oldest in Europe. The Leys School (q.v.), founded in 1874, is a public school for boys. There are 4 large grammar schools: Perse School (q.v.), founded in 1815; Perse School for Girls (1881); and the C. and co. high schools for girls and boys. The tn is built chiefly on the Rts. Granta and Cam (1 riv.). It has manufs. of scientific instruments, and light and electrical engineering, and it is the centre of a prosperous agric. dist. The name is generally derived from *Grantebrigg*, or *Grantabridge*, though the intermediate stages are not extant. The pop., which was increased to 59,000 in 1922 by the operation of the Cambridge Corporation Act of that year, is now 90,910. See C. W. Stubbs, *The Story of Cambridge*, 1912, 1932; H. W. Downs, *Cambridge, Past and Present*, 1926; N. Pevsner, *Cambridgeshire*, 1954; J. Steegman, *Cambridge*, 1954.

Cambridge: 1. City and one of the co. seats of Middx co., Massachusetts, U.S.A., on the Charles R. It almost forms a suburb of Boston. It is divided into various sections: Old C., the seat of Harvard Univ., Radcliffe College, and the Massachusetts Institute of Technology; N. C., the port; and E. C. The 2 last are the manufacturing dists. The prin. industries are the manuf. of soap, bakery products, rubber goods, confectioneries, foundry and machine-shop products, sheet-metal products, shoes, furniture, clothing, building supplies, and ink; printing and publishing are also carried on. Longfellow's home is a memorial. James Russell Lowell was b. here, and the first printing press estab. here (c. 1639) by Stephen Daye. Washington took command of Amer. Army in C. in 1775. Pop. 190,740.

2. Co. seat of Dorchester co., Maryland, U.S.A., on the Choptank R., 60 m. SE. of Baltimore, the centre of a farming region and a fishing port. It manufs.

canned vegetables, flour, clothing, boats, and steel and copper-wire products. Pop. 10,351.

Cambridge Platonists, group of 17th-cent. philosophers at Cambridge Univ. Led by Ralph Cudworth (1617-88) (q.v.) the C. P. opposed the narrow Puritan dogmatism, as well as the materialism of Hobbes and Descartes. They taught the spiritual constitution of the universe, and the harmony of reason and religion. Other members of the group were Henry More (q.v. 1614-87), John Smith (1618-1652), and Nathanael Culverwell (d. 1651). See C. E. Lowrey, *The Philosophy of Cudworth*, 1834, and F. J. Powicke, *The Cambridge Platonists*, 1926.

'**Cambridge Review**,' jour. of univ. life and thought, founded in 1879, appearing weekly in full term. It contains articles and book reviews of academic and general interest (by senior and junior members of the univ. and others), reviews of current athletic and artistic events, and editorial comment on univ. affairs.

Cambridge University is one of the oldest univs. in Europe. The earliest evidence that there were bodies of students in Cambridge dates from the beginning of the 13th cent. In 1231 Henry III issued a number of writs for the organisation and discipline of the students, and in 1284 Peterhouse, the first of the colleges, came into being as a house of residence for members of the univ. Formal recognition of the univ. came in 1318 when Pope John XXII, at the request of Edward II, confirmed its privileges with the issue of a bull decreeing that it should be a *studium generale* and should enjoy the privileges of a *Universitas*. From then onwards a Cambridge doctor could lecture in any part of the Christian world, and the univ. itself was independent of the jurisdiction of the bishop of its diocese. New statutes were given to the univ. in the year 1570, and in 1573 it received its grant of arms. The prin. effect of the new statutes, which remained in force for nearly 300 years, was to increase the power of the vice-chancellor and the heads of the colleges.

In the medieval univ. the student followed a 3-year course of Lat. grammar, logic, and rhetoric, known as the *trivium*, and became an 'incepting' bachelor. He then proceeded to the *quadrivium*—a course of geometry, arithmetic, music, and astronomy, lasting for 4 years and was then entitled to proceed to the degree of Master of Arts. Until the 15th cent. the prin. subjects of further study were theology, canon law, civil law, and medicine, and candidature for a doctor's degree required a further period of residence of at least 8 years. The 16th cent. saw the introduction of Greek, when Erasmus held the Lady Margaret's professorship of divinity in 1511, and the stimulus received from the Reformation was responsible for a great development in the univ. which at this time came to be considered a rival to the univ. of Oxford.

During the Civil war the sympathies of the colleges were Royalist, and many of the heads of colleges were deprived of their

offices, which were, however, restored after the Restoration. The latter half of the 17th cent. was noteworthy for 2 developments within the univ.—the rise of the Cambridge Platonists (q.v.) and the increasing prominence of mathematical studies. The first professorship of mathematics was estab. in 1663, and its second holder (1669) was Isaac Newton.

The univ. curriculum was further broadened throughout the 18th cent., and examinations assumed a greater importance, in contrast with the disputations, known as 'acts' and 'opponencies,' of earlier times. Written examinations were first introduced in 1772.

and in 1914 the univ. made formal application for a subsidy from public funds. This led to the first gov. grant of £5873 for medical education. In 1919 the vice-chancellor informed the president of the board of education that the univ. would welcome an inquiry into its resources, and stressed its urgent financial needs. The result was a special grant from the Treasury of £30,000, the forerunner of increasing ann. grants subsequently provided on the recommendation of the Univ. Grants Committee. In 1919 a royal commission on the univs. of Oxford and Cambridge was set up. It reported in 1922, and was followed by a statutory



ST JOHN'S COLLEGE, CAMBRIDGE

The 19th cent. was a period of reform and expansion. Honours examinations or triposes (see below) were introduced in classics in 1824, and within 50 years in moral sciences, natural sciences, law, and hist. In 1871 religious tests were abolished. In 1850 and 1872 royal commissions recommended many changes, which resulted in the statutes of 1856 and the Oxford and Cambridge Act, 1882. The prin. results of the legislation of this period were (1) to redress the balance between the univ. and the colleges, and to give to the general body of Masters of Arts much of the influence hitherto exercised by the college heads; (2) to abolish the tenure of college fellowships for life without conditions of work or residence, and to associate them with the holding of a univ. or college office; and (3) to raise the general intellectual level by competition among entrants to the univ., and among the senior members.

The development of univ. studies during the last years of the 19th cent. and the beginning of the 20th cent. outstripped the capacity of the univ. and the colleges,

whose statutes were approved by the king in council in 1926. The main effects of these statutes were (1) the transference of the control of univ. legislation from the Senate (Masters of Arts and holders of higher degrees) to the Regent House (approximately the resident members of the Senate); (2) the institution of the faculty system of instruction with a consequential transference of formal teaching from college to univ. teaching officers; (3) the fixing of age limits for the tenure of univ. and college offices; and (4) the setting up of an obligatory pension scheme. By those statutes the univ. is still governed.

While certain functions are reserved to the Senate, such as the election of the chancellor and other officers of the univ., and the approval of proposals for the conferment of degrees, the gov. of the univ. now rests in effect with the Regent House. Legislative proposals are called *graces* (Lat. *gratia*), which are submitted at periodic meetings of the Senate and of the Regent House, called congregations, presided over by the vice-chancellor.

The colleges of the univ. are corporate bodies having their own statutes and managing their own affairs. Further information is given in articles under their respective names. In order of foundation they are Peterhouse, Clare, Pembroke, Gonville and Caius, Trinity Hall, Corpus Christi, King's, Queen's, St Catharine's, Jesus, Christ's, St John's, Magdalene, Trinity, Emmanuel, Sidney Sussex, Downing, Girton (for women), Newnham (for women), Selwyn, and Fitzwilliam House (for non-collegiate students). Women first became full members of the univ. in 1947. Before coming into residence a candidate for admission to the univ. must be accepted by a college, must pass or gain exemption from the Previous Examination (including papers in Latin), and may also have to pass a college entrance examination. At the end of 3 years an undergraduate may proceed to the degree of Bachelor of Arts. Honours degrees are conferred on the results of examinations called triposes, which are held annually in May and June in mathematics, classics, moral sciences, natural sciences, theology, law, hist., oriental languages, modern and medieval languages, mechanical sciences, economics, archaeology and anthropology, English, geography, music, and chemical engineering. Special examinations are held for degrees in medicine and surgery. An Ordinary B.A. degree may be conferred on a student who has passed examinations in Christian theology, architectural studies, engineering studies, agriculture, or estate management.

Facilities for the education of adults who are not members of the univ. are provided in the form of lectures and classes at centres outside Cambridge, and of vacation courses in Cambridge, by the Univ. Board of Extra-mural Studies.

The number of students in residence during the academic year 1964-5 was 7934 (men 7217, women 717), of whom 720 were undertaking research for a higher degree or for a diploma.

See *Statutes and Ordinances of the University of Cambridge*, 1955 (reprinted every 3 years, supplement pub. annually); *The Student's Handbook to Cambridge* (pub. annually); *The Annual Register*; R. Willis and J. W. Clark, *Architectural History of the University of Cambridge*, 1886; T. Atkinson, *Cambridge Described and Illustrated*, 1897; S. O. Roberts, *Introduction to Cambridge*, 1948; *Report of the Oxford and Cambridge University Commission*, 1922.

Cambridge University Press. John Lair of Siegburg, usually known as John Siberch, set up his press in Cambridge in 1521 and became the first printer to the univ. Since that date a succession of univ. printers has exploited the privileges granted to the univ. by a charter of Henry VIII in 1534, to print and sell 'all manner of books.' The C. U. P. is a dept of the univ. controlled by a syndicate of senior members, and all its pubs. are issued under the univ. imprint. The head office of the C. U. P., and the printing works, are in Cambridge. The publishing office (Bentley House) in London is still the only

London publishing house built specially for the purpose. Since 1949 the C. U. P. has had a branch office in New York. Cambridge is one of the 3 Eng. presses which may lawfully print the Authorised Version of the Bible and claims to be the oldest Bible house in the world. Besides books and Bibles, the syndics also issue some 40 jour., many of them pub. for learned societies. The output of the C. U. P. consists largely of works of learning and primary scholarship in all branches of knowledge. The series of co-operative *Cambridge Histories*, inaugurated by Lord Acton at the end of the 19th cent. and continuing now with the *New Cambridge Modern History*, are perhaps the best known of the larger Cambridge ventures. The C. U. P. also publishes textbooks for univ. students, and since 1872, when the Pitt Press series was inaugurated, the syndics have produced a wide variety of books for schools in all subjects. In the years after the First World War Mr Walter Lewis, then univ. printer, and his typographical adviser, Mr Stanley Morison, estab. Cambridge among the leaders in the revival of Eng. typography.

Cambridgeshire, E. inland co. of England, bounded N. by Lincoln, E. by Norfolk and Suffolk, S. by Essex and Herts, W. by Beds, Hunts, and Northants. In Celtic times C. was in the ter. of the Iceni, and possesses some remains of pre-Rom. work, while relics of the Rom. occupation, in roads, urns, coins, etc., are common. At the Norman Conquest the men of the dist. made a stubborn resistance to the Norman invader, and it was at Ely that Hereward the Wake held out against him for some years. The co. was also prominent in the intestine struggles under Stephen, John, Henry III, and Charles I. The surface is generally very flat, and large parts, particularly in the N., consist of fens (q.v.). Undulations occur in the S., where are the Gog Magog Hills, and in the SE., in the area of Weston Colville, W. Wickham, and Castle Camps. The S. is also better wooded than the rest of the co. In the N. occurs the Bedford Level (q.v.). The prin. riv. is the Ouse, which crosses the co. from W. to E., with its tribs., the Cam, Lark, and Little Ouse. The Nene, in the N., is also important. These rivs. flow chiefly in artificial channels of recent construction, and are extremely sluggish. The co. is intersected by numerous drainage works. C. is a rich agric. dist., and the climate is on the whole healthy. The fenland, when drained and burnt, provides good soil for various crops, and the hills are mainly chalk. The co. is one of the chief grain-producing dists. of England. Dairy farming and sheep-rearing are also extensively carried on. There are practically no manufs., but brewing and brickmaking are carried on, and scientific and electrical instruments, and insecticides and other chemicals, are made. C. returns 1 member to Parliament, besides 1 sent from Cambridge city. The prin. tns are Cambridge (the co. tn), Wisbech, March, Soham, and Thorney. The race-courses of Newmarket lie in C.,

though the tn is in the co of Suffolk. Area (including Isle of Ely) 555,118 ac. Pop., exclusive of administrative co. of Isle of Ely, 177,100 (including Isle of Ely, 285,520). See C. C. Babbington, *Ancient Cambridgeshire*, 1883; E. Conybeare, *History of Cambridgeshire*, 1897; C. Fox, *The Archaeology of the Cambridge Region*, 1923; A. Mee, *Cambridgeshire*, 1938.

Cambridgeshire Regiment, The, raised in 1860 as a volunteer battalion. A contingent served in the S. African war, 1899-1902. In 1908 it became a unit of the Territorial Force (now Army). During the First World War it went to France in Feb. 1915 and within a month distinguished itself at St. Eloi. Four battalions were raised for the campaign and took part in the battles of Ypres, the Somme, Kommel Hill, and the allied victorious final advance. During the Second World War the C. R. produced 2 battalions; both went out to Singapore and both were lost, being captured by the Japanese. The regiment was reconstituted in Jan. 1947, and is now a Light A.A. Regiment R.A. (T.A.). For some years it formed part of the corps of The Suffolk Regiment.

Cambridgeshire Village Colleges, centres for further education and local community activities estab. at 5 vils. in Cambs, England, namely, Linton, Sawston, Bottisham, Impington, and Bassingbourn. Two more are planned for Swavesey and Soham. Each college serves an area including approximately a dozen contributory vils.

Cambuskenneth, ruined abbey in Stirlingshire, Scotland, on R. Forth, 1 m. E. of Stirling, founded by David I in 1147. The first Scots Parliament, attended by representatives of burghs, assembled here in 1326. James III and his queen, Margaret of Denmark, were buried in the abbey, and their remains were discovered during excavations in 1864, and reinterred with an altar memorial erected over them by command of Queen Victoria in 1865.

Cambuslang, non-burghal tn, including Newton and Carmunnock vils., in NW. Lanarkshire, Scotland, situated on the l. b. of the R. Clyde, 5 n. SE. of Glasgow. It has large steel works and coal-mines. Pop. 27,100.

Cambyses, or **Kambuliyā** (529-521 BC), second king of the Medes and Persians, was the son of Cyrus the Great. After conquering W. Asia and assassinating his brother Smerdis, he wished to form an alliance with Egypt, but, receiving an affront from the Pharaoh, he invaded that country, and conquered it in 6 months (525 BC).

Camden, Charles Pratt, 1st Earl (1714-1794), lawyer and politician, b. Kensington, and educ. Eton and King's College, Cambridge. He was called to the Bar in 1738, but had practically no briefs till 1752, when he made his name as junior to R. Henley, who fell ill and left the case to him. He was made king's counsel and attorney-general to the Prince of Wales in 1755, in 1757 attorney-general, and in 1759 recorder of Bath. In 1761 he was knighted and made chief justice of the

court of common pleas, and in 1765 was raised to the peerage as Baron C. of Camden Place, Kent. In the following year he succeeded Worthington on the woolsack, receiving an addition of £1500 to his salary as recompense for the loss of his justiceship. He held the office till 1770, although he disapproved of the policy of the gov. Created Earl C., 1786.

Camden, William (1551-1623), scholar, historian, and antiquary, b. London, and educ. at Christ's Hospital, St Paul's School, and Christ Church, Oxford. In 1575 he was made second master of Westminster School, of which he became headmaster in 1593. The first ed. of *Britannia*, the work which has made his name famous, was pub. in 1586, the result of some 15 years' research (in 1605 he pub. his *Remains Concerning Britain*, a book of collections from his *Britannia*). He was perpetually improving this, and in 1607 the sixth ed. was reached. It is written in elegant Latin, and was first trans. into English in 1610. In 1597 C. resigned his headmastership on being appointed Clarenceux king-of-arms. He endowed the C. professorship of ant. hist. at Oxford, and in 1883 the C. Society was founded in his honour.

Camden: 1. City and port of New Jersey in U.S.A., and the cap. of C. co. It stands on the l. b. of the Delaware, opposite Philadelphia, and has foundries, cotton and woollen mills, chemical and glass works. It manufs. television, radio, phonograph, and other electronic products, and is the seat of the college of St. Jersey. The homes of Walt Whitman and Joseph Cooper were here. Pop. 124,555.

2. Co. seat of Kershaw co., S. Carolina, U.S.A., 33 m. NE. of Columbus. It was occupied by the British in 1780 when an Amer. force was defeated here by Lord Cornwallis. Cotton, grain, and rice are produced in the vicinity. It has lumber mills and a brass and iron foundry; there is also some printing. Pop. 7000.

Camden, tn on Nepean R. in Cumberland co., New S. Wales, Australia, 38 m. SW. of the city of Sydney. It is one of the oldest tns in the state and is surrounded by dairying dists. Pop. 4930.

Camden Town, dist. of London in the metropolitan bor. of St Pancras, developed from 1791 onwards when Lord Camden let out his land for building leases.

Camel (Arabic *djmal*), name given to the 1-humped Arabian *Camelus dromedarius* (see DROMEDARY), and to the 2-humped Asian *C. bactrianus*. The C.s and llamas form a family (Camelidae) of the ruminant div. of the order Artiodactyla. The Arabian C. is used in N. Africa and India, as well as in Arabia; it was also introduced into Australia in 1860, and into N. America, but is no longer used in either country. It is not so well able to withstand the cold as the Bactrian C., which has a much thicker coat and shorter legs, but it is swifter. The C. has a long thigh, which is vertical in position, and this accounts for its peculiar swaying walk. The humps vary in size, according to the condition of the

animal; they are reserves of fat and become small and flaccid after many days of hardship and indifferent food. It exists chiefly on the leaves of trees and dry vegetables. The female carries her young for 11 months, and a week after birth the baby C. has attained a height of 3 ft, but it is not full grown until its sixteenth or seventeenth year. It lives from 40 to 50 years. The power of carrying water in its stomach and living on limited quantities of food earned for it the title 'ship of the desert.' While on a journey through the desert a C. will go 3 days, doing 25 m. every day, without water, but on the fourth day it must receive a supply; the swifter breeds, for there are

of the gift that Abraham received from Pharaoh. The flesh of the C. is a very favourite food among the Arabs; their milk also forms a good and nutritious beverage. The Arabs weave the hair of the C. into various materials for clothing; it is also imported into Europe, and used in the manu. of artists' brushes. The mounting of infantry on C.s has proved of great advantage, as it enables the men to reconnoitre in hot, arid countries, where water is not easily found, and where horses are not of much service. European troops have often made use of C.s in this way, when operating in India, Egypt, and the Sudan. In many of the central Asian deserts the Bactrian species is to be found in its wild condition, but these may be derived from escaped domesticated individuals.

Camel, apparatus used for raising a ship, so as to render it navigable in shallow water, consisting of large hollow vessels attached to the ship's side. Invented by a Russian engineer, De Witte, and much used between Kronstadt and Leningrad.

Camelford, mrkt tn of Cornwall, England, situated on the Camel, 28 m. NW. of Plymouth. The ruins of the castle associated with the name of King Arthur are situated at Tintagel (q.v.), 4 m. to the NW. Agriculture is the local industry. Pop. 1500.

Camelina, genus of cruciferous annuals which belong to Europe and the Mediterranean. *C. albus* is sometimes found in Britain, where *C. sativa*, Gold of Pleasure, or Siberian oil-seed, also occurs. The latter is of humble appearance, has small yellow flowers, and yields a good fibre.

Camellia, Asiatic genus of evergreen trees and shrubs belonging to the family Theaceae, with thick, dark, shiny leaves, and white or rose-pink flowers. Linnaeus so named it after Camellus, or Kamel, a Moravian Jesuit, who wrote an account of the flora of Luzon. There are sev. species, the best known being *C. japonica* and *C. reticulata*. The former originally came from Japan, being introduced into England in 1739. Its flowers are red, and it grows to a height of 30 ft. The latter was brought from China, and is a much smaller plant, with large pink flowers, known as semi-double. *C. oleifera* has sweet-scented white flowers; *C. sasanqua*, an inhab. of China and Japan, and *C. drupifera*, from Cochin China and the mts of India, are both oil-yielding species. The oil of *C. sasanqua* is in use for many domestic purposes, and has a pleasant odour; it is made by the crushing of the seeds into a coarse powder. The leaves of the plant are also made into a decoction and utilised by the Jap. women for their hair. The oil of *C. drupifera* is used for medicinal purposes. The C. is generally grown in Great Britain under glass, but it does well in the open in rich sandy peat and loam, with shelter from the cold easterly winds. It is propagated by layers or cuttings, also by seeds. Sev. varieties of *C. sinensis*, the source of tea, are cultivated in India, Java, China, and



E.N.A.

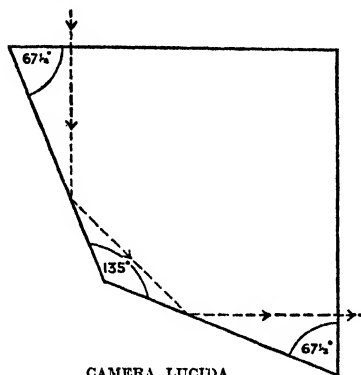
CAMEL AND YOUNG

many varieties of the Arabian C., will go much longer, and travel over 60 m. a day without refreshment. If too heavily laden it will sometimes refuse to rise; but while on its journey it bears its burden patiently, and will often only succumb under it to die. If a sandstorm should arise, it falls on its knees, stretches its neck along the sand, and, closing its nostrils, remains in that position until the storm has passed. In character the C. is a wild and savage animal, and it is due to the fact of its extreme stupidity and passiveness, and not to any instinct of attachment to its master, that man has been enabled to make it of any service. At times the males become very fierce and dangerous, and make savage assaults on their fellows. It is not until its fourth year that its training as a beast of burden commences; it is then taught to rise and kneel at a given signal, and is accustomed by degrees to carry increasing loads, which may weigh anything from 50 to 1000 lb., according to the breed of the C. which is used. We have evidence that the Arabian C.s were some of the earliest animals used for domestic purposes, for according to Scripture 6000 of these beasts formed part of the great possessions of Job. They were also included as part

Japan. *C. × williamsii* and *C. 'Cornish Snow'* are notable hybrids raised in Cornwall.

Camelopard, see GIRAFFE.

Camelopardalis (the Giraffe), constellation near the N. Pole, between Ursa Major and Cassiopeia. It was originally discovered by Jacobus Bartschius, 1624, and added to the astronomical maps by Hevelius (q.v.).



CAMERA LUCIDA

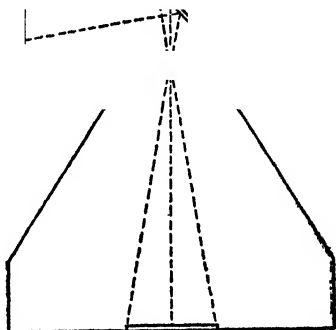
Camelot, name given in medieval romance to the seat of King Arthur. It has been identified with Caerleon-upon-Usk, and also with Winchester, Cadbury Camp near Queen Camel in Somerset, and Tintagel in the Camel country of Cornwall. It is mentioned by Tennyson in *The Lady of Shalott* and *The Idylls of the King*, and by Shakespeare in *King Lear*.

Cameo, or Camaleu (It. *caméo*, from Medieval Lat. *cammaeus*). The word was in use in the 13th cent.; a C. is an engraved gem in which the figure, or subject, is carved in relief in a stone or other material providing 2 different layers of colour, in one of which the design is cut, the second colour forming a background. The intaglio, in contrast, is a gem in which the engraved subject is hollowed out as in the manner of a seal. The Egyptian scarab is an early example. In Greece it was not until after the time of Praxiteles that C. cutting developed as an art. The stones used for the purpose were brought from the E., and most of them were of magnificent size and colour. In Imperial Rome such rich materials, elaborately wrought, were in demand for the ornamentation of caskets, vases, cups, etc., as well as for personal adornments. Many of these have been preserved in excellent condition, and are to be found in various private and public collections. One of the most famous C.s is the Gonzaga, or Odescalchi, originally in the possession of the Empress Josephine, and later preserved in the Imperial cabinet in Leningrad. On it are represented the portraits of Nero and Agrippina. Another smaller but not less valuable C. is that of Jupiter fighting

the Titans, by Athenion (AD 50), now in the Vatican. The Portland Vase (q.v.), in the Brit. Museum, is a further example. The art of C. cutting was revived during the 15th cent. in Italy and was carried on with great success until comparatively recent times. Pistrucci ending the long line of renowned engravers. In England Josiah Wedgwood initiated the C. (white on a coloured ground) in pottery. The modern C. cutters of Italy and other places, finding there was great difficulty in treating the hard gems, also being unable to obtain a sufficient supply of the fine ones necessary for the work, began to think of some other method: hence the introduction of shell C.s. The shells of various molluscs are now often used for making C.s. They are also imitated on glass, and in a cheap, mass-produced form in plastic mouldings. See also GEM.

Camera, see PHOTOGRAPHY.

Camera Lucida, optical instrument constructed for various purposes. Hooke was the inventor of one about 1674, and Wollaston brought out another in 1807. This latter one was intended to facilitate the perspective outline of objects, and consists of a 4-sided prism of glass, having one angle of 90 degrees, and the opposite angle of 135 degrees, while the other 2 angles are each of 67 1/2 degrees. The C. L. was of some importance to draughtsmen, before photography was used in that capacity, on account of its small size, which rendered it easily portable. Its chief use was in copying, reducing, or enlarging drawings.



CAMERA OBSCURA

O, object; M, mirror; L, lens; I, image.

Camera Obscura, an optical apparatus by means of which the images of objects are made to appear on a light or white surface, or a darkened room in which an image of surrounding objects is projected on to a large screen by a long-focus convergent lens. At the top of the dark chamber is a box containing a convex lens and sloping mirror. If a plane mirror

is placed behind the lens at an angle of 45 degrees to the horizon so that the rays of light would be reflected vertically downwards, an image is produced on the horizontal viewing table. Standing with one's back to the object the image will appear right way up but reversed left to right. This is the principle of the C. O. Its invention has been ascribed to Giovanni Battista della Porta, 1569, but it is a well-known fact that this principle had been recognised, and made use of, many years before his time. The C. O. was first employed in the interests of photography about 1794, by Thomas Wedgwood.

Camerarius, Joachim (1500-74), Ger. scholar, b. Bamberg. His proper name was Liebhard, but as the office of chamberlain at the court of the bishops of Bamberg was always held by his family, he changed it to C. (Ger. *Kämmerer*, late Lat. *Camerarius*). One of the most distinguished philologists of his time, he improved the organisation of the univs. of Leipzig and Tübingen. He helped to prepare the Confession of Augsburg, 1530, and in 1555 was deputy of Leipzig Univ. to the Diet of Augsburg. He was a friend of Melancthon, of whom he wrote a biography in 1566. His many works include trans. of the classics, and monographs on Gk and Lat. philology and antiquities.

Camerino, It. tn, in the Marches (q.v.), 23 m. SW. of Macerata (q.v.). It is situated on an E. spur of the Apennines, and has an archiepiscopal cathedral, a univ. (non-state) founded in 1727, and silk manufs. Pop. 12,000.

Camerlingo, sometimes **Camerlingo** (It., 'chamberlain'), the cardinal who administers the property and revenues of the Holy See. He is the head of the Sacred College of Cardinals between the death of the Pope and the election of his successor, and he presides over the election.

Cameron, Sir David Young (1865-1945), painter, b. Glasgow. Skilled as an etcher, also painted landscape, especially Scottish scenes. A.R.A., 1911; R.A., 1920. Knighted, 1924. In 1935 he was appointed painter-in-honour to the king's household in Scotland.

Cameron, Sir Donald Charles (1872-1948), Brit. colonial administrator, educ. Rathmines school, Dublin, and entered the civil service of Brit. Guiana in 1890. He acted as colonial secretary of Mauritius between 1904 and 1907; in 1908 he became assistant secretary to the gov. of S. Nigeria, and in 1911 prin. assistant secretary. In 1914, when Lagos and S. Nigeria were united with N. Nigeria as the colony and protectorate of Nigeria (see NIGERIA), with Lugard as governor-general (see LUGARD, LORD), C. was promoted to be secretary to the central gov. In 1924 C. was promoted to be governor of Tanganyika Ter. where his Nigerian experience made him exceptionally well qualified to administer a country equal in size to Nigeria. Here his name is especially associated with the organisation of a system of native administration known as 'indirect rule' modelled on the principles already in operation in Brit. W. Africa. In the same year he inaugurated

the creation of an African civil service, improved the public health service of Tanganyika, and promoted the estab. of gov. schools in that ter. From 1931 to 1935 he was governor of Nigeria. His own account of his administration was pub. in 1939 in *My Tanganyika Service and Some Nigeria*. K.B.E., 1923; K.O.M.G., 1926; G.O.M.G., 1932.

Cameron, Fairfax of, see FAIRFAX.

Cameron, John (d. 1446), Bishop of Glasgow and chancellor of Scotland. In 1424 he was appointed secretary to King James I; keeper of the privy seal, 1425; keeper of the great seal, 1427; Bishop of Glasgow and chancellor of Scotland, 1428.

Cameron, John (c. 1579-1625), scholar and theologian, b. Glasgow. He studied at the univ. there. In 1600 he visited the Continent and taught classics and philosophy in many continental colleges, becoming prof. of divinity in the univ. of Saumur in 1618. In 1620 he returned to Britain, and in 1622 became principal of Glasgow Univ. His advocacy of the divine right of kings made many enemies, and in 1623 he returned to Saumur and thence went to Montauban as prof. of divinity.

Cameron, Richard (c. 1648-80), Covenant, b. Falkland, Fife, where he became schoolmaster. Converted by the field preachers from Episcopacy, he became an extreme Presbyterian, and preached in Annandale and Clydesdale. In 1678 he went to Holland, and returned in 1680 to take part in the Sanguhar Declaration, for which a price of 5100 marks was set upon his head. He took refuge with some comrades in the hills in Ayrshire, preaching whenever he found an opportunity, until surprised by a party of dragoons at Aird's Moss, when both he and his brother were slain. See CAMERONIANS.

Cameron, Verney Lovett (1844-94), African explorer, b. Radipole in Dorset. He entered the navy in 1857, served in the Mediterranean, the W. Indies, and the Red Sea, and took part in the Abyssinian expedition and in the suppression of the slave trade. In 1872 he was made head of the expedition to relieve Livingstone, and left Zanzibar in Mar. 1873, but at Uyanayembe met Livingstone's followers bearing his remains to the coast. He proceeded to Ujiji, where he found Livingstone's records, and subsequently explored the S. portion of Lake Tanganyika. Afterwards he explored the upper reaches of the Congo, but was prevented from tracing its course to the W. coast owing to the hostility of the natives. He then turned his attention to the Zambesi, of which he discovered the sources, and in 1875 crossed Africa from E. to W., being the first traveller to achieve this feat. In 1878 he explored the route for a Constantinople to Bagdad railway from Beirut to Bushire, and in 1882, with Sir R. Burton, visited the Gold Coast. He wrote among other works, *Across Africa*, 1877, *Our Future Highway to India*, 1880, and some books for boys.

Cameron Highlanders, The Queen's Own. Formerly 79th Foot. Raised 1793 by Lt.-Gen. Alan Cameron, who in that

year raised some 800 young men in his native co. Inverness, and led them in most of the battles of the Peninsular campaign and at Waterloo. Its other campaigns are Crimea, Indian Mutiny, Egypt 1882, Nile 1884-5, S. African 1900-2. During the First World War it raised thirteen battalions, which served in France, Flanders, and Macedonia. In the Second World War the C. H. saw service on all the 3 major fronts—NW. Europe, N. Africa, and Italy—and in Burma. As part of the 51st Highland Div. under Maj.-Gen. Douglas Wimberley, the C. H. were in very hard fighting in 1943 at the battle of Akaret, particularly on 6 April on the Roumana Ridge. Other units were part of the Chindit force, in Burma. The Cameron and the Seaforth Highlanders are to be amalgamated by 1962. See C. Gardyne, *The Life of a Regiment*, 1923.

Cameronians, followers of Richard Cameron (q.v.), a Scottish Covenanter, who separated from the Church of Scotland towards the end of the 17th cent. on a question of eccles. polity. The C. refused to recognise the State control over the Church, and adhered strictly to the Solemn League and Covenant, ratified by the assembly of Westminster divines in 1643. They separated from the Presbyterian Church, and were officially known as the Reformed Presbyterians. The C. were bigoted fanatics, but undoubtedly acted from high motives. They refused to take the oath of allegiance, and thus cut themselves off from some of the privileges of citizenship. In 1876 the Reformed Presbyterians formally united with the Free Church, who also maintained the spiritual independence of the Church of Christ. There are, however, in the highlands a few who still call themselves C. See Walker, *Six Saints of the Covenant* (repub. in 1901).

Cameronians, The (Scottish Rifles), formerly 26th and 90th Foot. The first of these was raised in 1689 from the amnestied survivors of the Cameronian covenants to help William III against James II. As the Earl of Angus's regiment, it served with distinction under William III, and later under Marlborough. Under Abercromby it gained further laurels in the Egyptian campaign of 1801, and also under Moore at Corunna in 1808-1809. The 90th Foot, raised by Thomas Graham, later Lord Lynedoch, in 1794, also served in the Egyptian campaign of 1801. It distinguished itself in the Indian Mutiny and the Zulu War of 1879. In 1881 the 26th and 90th were linked to form one regiment, and as such served in the S. African (1899-1902) war. During the First World War it raised 27 battalions, which served in France, Flanders, Macedonia, Gallipoli, and Palestine. The C. took part in battles in all the major theatres of war in the Second World War. In Burma they were part of the Chindit force of Maj.-Gen. Wingate. They played the chief role in the epic capture of Walcheren and S. Beveland early in 1945, suffering heavy losses in the final stages of the assault when the Germans rallied to

counter-attack. They also took part in the Rhine operations of the Second Brit. Army, notably in Mar. 1945. The depot is at Hamilton.

Cameroon, formerly a Ger. colony (Kamerun) on the W. coast of Africa, extending from the mouth of the Rio del Bey to a point slightly below 3° N. lat. It is now administered as trusteeship ter. by the British and the French. Formerly known as the Oil Coast, the ter. was demarcated by treaty between England and Germany in 1893, and between Germany and France in 1885 and 1894; and was increased in Nov. 1911 by acquisition of part of Fr. Equatorial Africa in compensation for recognition of Fr. suzerainty over Morocco. It is a mountainous country, with a strip of low-lying land near the coast. The prin. rivs. are the Lom, Nyory, Lokinya, and Kribi. The part that was ceded to Germany in 1911 is watered by the Logone, which flows into Lake Chad, and the Sanga, which is a trib. of the Congo. There is considerable rainfall, with no prolonged dry season. In Sept. 1914 Brit., Fr., and Belgian native troops, under European officers commanded by Maj.-Gen. Sir Charles Dobell, invaded the C. and destroyed the important wireless station at Douala which surrendered on 27 Sept. By April 1916 the ter. was entirely in allied hands.

By the Milner-Simon agreement of 1919 the whole area was divided into a Brit. sphere of about 34,000 sq. m. and a Fr. sphere of about 143,400 sq. m. and in 1922 the ters. were placed by the League of Nations under Brit. and Fr. mandates. The C. under Brit. trusteeship stretches the entire distance of the Nigerian E. boundary, except for one short break. The C. under the Fr. trusteeship borders on the Atlantic and has a pop. of 3,115,600 natives and 12,200 French. By decrees of 1921 and 1925 the Fr. C. was constituted an autonomous ter., both administratively and financially. The 1954 exports from the Fr. C. were cocoa (50,032 metric tons), palm kernels (16,810), timber, coffee, palm oil, rubber, bananas, ground-nuts, and cotton. In Fr. C. there are 16,000 km. of roads and 505 km. of railway. The 2 narrow strips of ter. extend from the Atlantic to Lake Chad, a distance of 700 m., and lie diagonally between 4°-12° 30' N. lat. and 8° 30'-14° 45' E. long. The nature of the country varies to a remarkable extent, from the coastal mangrove swamps and dense forest region to the grasslands at heights of 400 to 7000 ft. and again to sandy, swampy tracts in the Dikwa country and around Lake Chad. The highest peak is C. Mt, a volcanic mt 13,350 ft high. The Brit. C. is administered as part of Nigeria; administrative H.Q. are at Buea. The estimated pop. is 753,000. The N. areas are administered by the residents of the neighbouring provs. of Adamawa, Bornu, and Benue; the S. part forms a separate prov., known as the C.s Trust Ter. C.s Prov. is rich with timber, and the volcanic soil of the C. Mt is especially fertile. The ports Victoria and Tiko are linked to Buea by motor road. The exports are

cocoa, palm kernels, rubber, bananas, and mahogany. The Victoria dist. contained large Ger. cocoa, rubber, and banana plantations, with some 43,000 ac. under cultivation. Victoria lies amidst fine scenery and has a botanic garden planted by the Germans. Buea was the Ger. administrative cap. The wealth of the forests and minerals is as yet little exploited. There are 315 m. of railways and 3100 of roads. An 'Outline Plan of Development and Welfare, 1955-60,' Sessional Paper No. 2 of 1955, envisages an expenditure of over \$1,300,000 on road development (\$659,000), education (\$323,000), agriculture (\$230,000), and medical services (\$145,000). For the period 1955-60 the Brit. C. was allocated \$1,330,000 under the Colonial Development and Welfare Act of 1955. See also COLONIAL TRUSTEESHIP. See F. W. Migeod, *Through British Cameroons*, 1925, and ann. reports of the Colonial Office to the Permanent Mandates Commission of the League of Nations (H.M.S.O.).

Camillus, Marcus Furius (d. 365 BC), Rom. patrician and one of the great republican heroes. He was censor in 403. In 396 he took Veii, which had withstood a 10-year siege, and in 394 he captured Falterii. Being accused of misappropriating the booty of Veii, he retired to Ardea in 391. It is reported that he returned in the nick of time to stop Brennus from taking the Capitol. He opposed the desire of the plebs to move to Veii, and was largely instrumental in rebuilding the city. During subsequent campaigns he vanquished the Aequi, the Volsci, and the Etrusci, and finally, in 367 BC, the Gauls, near Alba. During his life he was elected military tribune with consular powers 6 times, and 5 times dictator. He d. of the plague.

Camisards, Huguenots or Protestants of the Cévennes, so called from the *camise* or white shirt which formed their uniform. They rose in revolt against the revocation of the Edict of Nantes by Louis XIV in 1685, and their zeal was fanned by the ruthless dragonnades, or quartering of dragoons upon Protestant households and the accompanying acts of cruelty in order to enforce conversion to the Catholic faith. At first consisting only of isolated outbreaks, the movement became more widespread after the murder in 1702 of the Abbé du Chayla, who for 15 years had proved a most heartless persecutor of the oppressed people. A general rebellion followed this event, and the rebels, now numbering some 3000, were able to maintain themselves for about 2 years in the mts against the royal forces. The defeat of some small detachments of soldiers led to Marshal Montrevel being sent to the dist. with an army of 60,000 men. The C. were, however, led by a young man with considerable military talent named Cavalier (q.v.), and though the royal army burnt sev. Camisard vils., Cavalier managed to increase the scope of the revolt. In 1704 Montrevel was superseded by Villars, who adopted more conciliatory measures, pardoning those who surrendered and releasing all prisoners

who swore allegiance, while his troops scoured the country in all directions and forced band after band of the insurgents to submit. In May 1704 Cavalier himself accepted the conditions offered, and left the country, with many of the more moderate C. A few zealots still held out, and the rising was renewed in 1705, but was put down ruthlessly, and the prov. entirely devastated. Cavalier and many others took service with the English and fought at Almanza in 1707. But the majority of the C. had perished in the fighting. The rebellion was marked by extreme brutality on both sides. See Anna Eliza Bray, *Revolt of the Protestants of the Cévennes*, 1870.

Camlet, cloth made in the Middle Ages from camel's hair, but now usually from the hair of the Angora goat, mixed with silk, nylon, wool, cotton, rayon, or linen.

Cammaerts, Émile (1878-), Belgian poet and author, b. Brussels, resident in England since 1908. He became prof. of Belgian studies in the univ. of London in 1931, and writes mainly in English. He came into prominence at the beginning of the First World War. with 2 vols. of Belgian poems, 1915 and 1918, the French being printed side by side with free Eng. trans. His pubs. include 4 vols. of trans. from John Ruskin and 1 from G. K. Chesterton, into French; *Les Deux Bossus* and *La Veillée de Noël*, plays, 1917; *Through the Iron Bars*, description of 2 years of Ger. occupation of Belgium, 1917; *Belgium from the Roman Invasion to the Present Day*, 1920; *Poèmes intimes*, 1922; *The Childhood of Christ as seen by the Primitive Masters*, 1922; *The Treasure House of Belgium*, a guide-book with a vein of historical learning, but mainly concerned with modern affairs, 1924; *Discoveries in England*, 1930; and *Rubens, Painter and Diplomat*, 1931.

Camoens (Camões), Luís Vaz de (1524 or 1525-80), most celebrated of Portuguese poets, was descended from an ant. noble and wealthy house. The exact place of his birth is disputed, but it is almost certain that he was b. Lisbon. By this time the full flood of the Renaissance was making itself felt in Europe, and among other countries Portugal was benefiting from the desire for further and fuller knowledge which seemed at this time to fill all men. C. was educ. at the college of All Saints at Coimbra, and steeped himself in the literature and mythology of the classics. He had an excellent memory, and little that he learnt was ever forgotten. His education, however, proceeded on very general lines, and there was practically no subject upon which he was not able to speak with some authority. He knew well the contemporary literatures of Spain and Italy, he had read much hist., and altogether we can say that his great poem *Os Lusíadas* (The Lusíads) gives evidence of his universal knowledge. He came then to Lisbon, which city made a firm and lasting impression on him, an impression which in his great poem he immortalised. He found easy entrance into the highest

society, and he quickly came to be recognised as a poet of no mean talent. Recent criticism has questioned the validity of a well-known tradition that makes him fall violently in love (in 1544) with Caterina de Ataíde, the daughter of a high official at court, who disapproved of his suit. This lady has been credited with the inspiration of many of his most impassioned sonnets, and has been described as his Beatrice. He was introduced at court, and here whilst he made many friends he also made enemies, and his too open passion quickly became a matter of gossip. He left the court, but his voluntary exile was restless; the verses which he wrote at this time show him to be now exuberant, now in the uttermost depths of despair. Many of his sonnets and roundels were written at this time, and from this period also date the greater number of his eclogues. He was now also employed in the composition of his patriotic poem, *Os Lusíadas*, but his love affairs were still unsettled, and he was finally forced into exile. His exile was probably hastened by the production of *El Rei Seleuco*. In his place of exile he composed *The Elegy of Exile*, and a number of beautiful sonnets. He now became a soldier, and in 1547 he fought against the Moors, and in an attack on Ceuta lost his right eye. Here he remained for the next 2 years still pouring forth verses, some despairing and sad, others philosophical; he himself seems to have been buoyed up by the memories of the past. In 1549 he prepared to go to India, and for that purpose returned to Lisbon; once there he found it impossible to drag himself away, and he remained to be near his love. But he indulged at this time in wild extravagances which finally landed him in prison, was pardoned, and proceeded to India. He sailed in 1553. In some poems he describes the voyage, which probably was not without its influence on *Os Lusíadas*, since after this date the discovery of India becomes the main theme. The Portuguese were at this time dominant in the E., and although C. was well received, he quickly became disgusted with his life at Goa. Between 1553 and 1555 he saw a fair amount of active service, his experiences being described in *Os Lusíadas*. He did not, however, stay at Goa, but travelled to many places in the E., usually to perform some military duty. He wrote whilst there *Desparates na Índia*, *Filodemo*, and *Satyra do Torneio*. He had acquired some little wealth, but now fortune turned against him. After waiting at Macao for a ship to take him back to India, he was imprisoned for intrigue, and he was shipwrecked whilst being brought back a prisoner to India. He managed to save his *Lusíadas*, but remained a prisoner in Cambodia, where he composed his *By the Waters of Babylon*. Still a prisoner he was taken back to Goa, where, according to tradition, he heard for the first time of the death of Caterina. It was on this occasion, or shortly after the shipwreck in which he lost his slave-girl, Dinamene, that he produced his famous sonnet *Alma Minha Gentil*. He

remained a prisoner for some time, being finally released when a friend of his became governor, and again for a short time he was imprisoned for debt. He was now very poor, but seems to have remained in India living a fairly happy life and working at his chief poem. For three years he was thus employed, and finally the poem was finished, and his ambition became to go back to Portugal and print it. In 1567 he got as far as Mozambique, but here again he was imprisoned for debt for 2 years, and finally by the charity of friends he was released from prison and sailed for home. He reached Portugal in 1569. He found his mother ready to welcome him; his father was dead, and now, having regained his home, he set about obtaining permission to print his poem. Permission was given in 1571, and the book appeared in 1572. It was received with acclamation by everybody. He was granted a substantial pension for three years, a period which was later extended, and he lived for a time in peace and enjoyment. In 1575 he fell, for a short time, into helpless poverty once more, but the renewal of his pension soon set him right again. In 1578 came the disaster of the battle of Alcaacer, and C. mourned the loss of his patron and king, Sebastian, in a magnificent sonnet. Early in 1580 the cardinal king d., and C., who saw the vanishing of Portuguese independence, had no further desire to live. In June of the same year the last of a great and illustrious line fell a victim to the plague which was ravaging Portugal. His greatest work was *Os Lusíadas* (or *The Lusitanians*) for which he has been not inaptly called the Virgil of Portugal. It has for its main theme the discovery of India and the greatness of Lusitania. It is written in ottava rima, and may be regarded as Portugal's national epic. C. also wrote comedies, sonnets, eclogues, and elegies. In 1918 a Camoens chair of Portuguese language and literature was estab. in King's College, London. See J. Adamson, *Life and Writings of Camoens*, 1820; Richard Fanshawe, *The Lusíad* (1st Eng. trans.), 1655; Sir R. F. Burton, *Translation of Camoens' Lusíad*, with *Life and Commentary*, 1880; J. J. Aubertin, *The Lusíadas* (trans.), 1884; T. Braga, *Camões e o sentimento nacional*, 1891; E. Prestage, *Minor Works of Camoens*, 1924; Leonard Bacon, *The Lusíadas* (trans.), 1950; H. Cidade, *Luis de Camões* (3 vols.), 1952-3 and 1956.

Camomile, or Chamomile, *Anthemis*, genus of Compositae. Herbs native to England and W. Europe, and cultivated for medicinal use. The most important species of the genus is *Anthemis nobilis*, from which an infusion of its flowers is obtained and used as a bitter stomachic and tonic. In olden times it was used in fevers, but now other more effective remedies are in use. In large doses the infusion acts as a simple emetic. Its flowers in the cultivated state are said to be double, and the most satisfactory results are obtained from the largest, whitest, and most perfected double flowers. The flowers have a very fragrant

odour, with an intensely bitter taste. In addition to the bitter extraction that is yielded, the C. also produces about 2 per cent of a volatile fluid, which at first is pale blue in colour, but on exposure to the light it turns yellowish-brown. The odour is fragrant, like that of the flowers, and it is composed of butyl amyl angelates, and valerates. Other Brit. species are of no account; one of these (*A. cotula*), known as the stinking C. or mayweed, is so pungent as to blister the fingers. A foreign species (*A. tinctoria*) yields by its flowers a beautiful dye. *A. arvensis*, Corn C., is an annual common on chalk. *A. nobilis* may be used in the making of C. lawns.

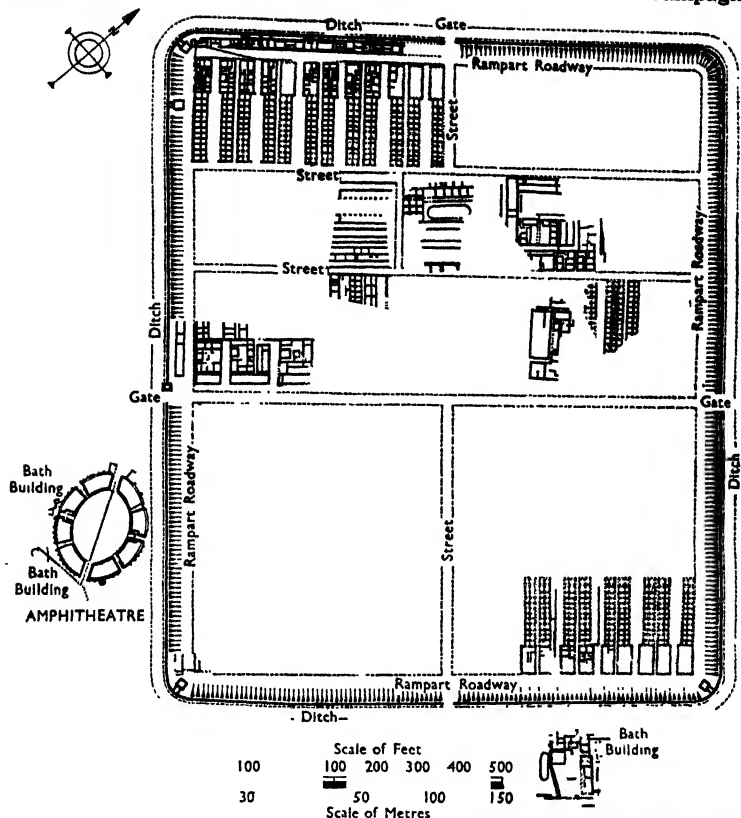
Camorra (It. *camorra*), secret society said to have been estab. about 1820 by prisoners in the Neapolitan dungeons to protect themselves against the brutalities of their jailers. The associates on their release transferred their practices to Naples itself, and in a few years the C. became a powerful organisation, practically controlling the life of the city. Smuggling, robbery, blackmail, all went on under its rules, traders having to pay heavy sums for permission to carry on their business, and the society derived a large revenue from brothels and the promotion of illegal lotteries; but while it remained non-political, it was unmolested by the authorities. After 1848 it adopted revolutionary ideas, becoming a political as well as criminal organisation, and controlling all elections. During the sixties it carried on a reign of terror in S. Italy, but after years of struggle its power was apparently broken by the gov. in 1877. But in 1900 so many Camorristi were proved to have attained high offices that the Neapolitan municipality was superseded for some months by a royal commission. In 1906 a double murder by some Camorristi led to the arrest of 40 conspirators, their chief being Enrico Albano. Witnesses' lives being unsafe at Naples, the court was removed to Viterbo, and the trial took place in 1911, long sentences of imprisonment being awarded to sev. of the accused. See A. C. Train, *Courts, Criminals, and the Camorra*, 1912.

Camouflage (from Fr. *camoufler*, to blind or veil). Although the word C. came into prominence only during the First World War, the principle of deceiving the enemy by artificial aids is very old. The deception most practised is that of so altering the appearance of troops or works as to render them either invisible or to assimilate them to the surrounding countryside. Hence during the S. African war of 1899-1902 Brit. troops were clothed in khaki, and practically all troops throughout the world wear uniform and equipment of a neutral shade. Taking cover by dressing troops in grass, reeds, or branches of trees is a very ant. practice. A good example is referred to by Shakespeare in *Macbeth*, where Macduff's army advances hidden by boughs (see Act v. sc. vi). C. was fairly easy before the development of aircraft, but during the First World War lines of trenches stood out in the landscape like huge scars and were most difficult to hide.

Air power confers great powers of observation upon an enemy, the antidote to which is a better use of C. So important was C. during First and Second World Wars that guns, tanks and vehicles, buildings, tents and marquees, were painted in such a manner as to deceive the observer from the air. C. on the sea was equally important, and the majority of low-powered ships were also painted in such a manner as to make observation from submarines difficult. The particular form adopted was known in the First World War as 'dazzle painting,' which gave a distorted appearance to vessels. Ships with high speed relied upon their speed for security against a submarine attack. During the Second World War C. was extended to all manner of buildings and works in Great Britain as a measure of defence against Ger. air-raids. For C. in nature see COLOURS OF ANIMALS and MIMICRY.

Camp, collection of tents or huts which is used to lodge soldiers on a campaign or during field manœuvres. On active service it is sometimes difficult to transport tentage for the troops, and cantonments and bivouacs (q.v.) take their place. But when the force is comparatively small, and stationed in a hot country, the troops are still placed under canvas. The different Cs. are distinguished by various ensigns in the daytime and by different coloured lamps at night. Thus a field hospital has a white flag with a red Geneva cross, or a red lamp; a supply and transport C. has a blue flag with a white centre, or a green lamp; an ordnance store C. has a blue flag with a red centre, or a yellow lamp. When near the enemy, on active service, the tactical considerations are of paramount importance; the C. must be so arranged that the troops can be in fighting order on the shortest notice. When this is observed, the C. should also have, if possible, a supply of good water, fuel, etc.; the ground should be firm with good natural drainage; and access should be open to good roads. When a large permanent garrison in barracks is visited by regulars and territorial troops during the drill season, for the purpose of combined manœuvres under war conditions, this is termed a C. of exercise. All the ordinary requirements of a good C. site, as mentioned above, should be complied with, and in addition a wide expanse of fairly wild and changing country is a necessity.

Camp, Roman. The Romans were the first nation to carry the science of encampment to any degree of perfection; their C. was the same in outline from the time of Polybius to the fall of the empire, and was in form as follows. The site was an exact square with sides of 2017 Rom. ft. The *via principalis*, or prin. street, 100 ft wide, divided the C. into 2 unequal parts. In the smaller part, facing the middle of the *via principalis*, was the *praetorium*, or commander-in-chief's tent. There were 4 gates in the C.: one at each end of the main street, named *porta principalis dextra* (right prin. gate), and *porta principalis sinistra* (left



PLAN OF EXCAVATED PARTS OF THE ROMAN CAMP AT CAERLEON, MONMOUTHSHIRE

prin. gate); the *porta praetoria* (praetorian gate), and the *porta decumana* (decuman gate). The whole C. was surrounded by a *vallum* (rampart) and a *fossa* (ditch); the former was composed of earth from the latter and was surmounted by a palisade.

Campagna, It. tn in Campania (q.v.), 17 m. E. of Salerno (q.v.). Pop. 9700.

Campagna di Roma, plain in Italy, surrounding the city of Rome (q.v.). It stretches along the Tyrrhenian Sea, from Civitavecchia to Terracina (qq.v.), and has as its E. boundary the Alban and Sabine hills (qq.v.). This tract, which comprises most of anct Latium (q.v.), is from 30 to 40 m. wide and about 100 m. long. The lakes of the C. are craters of extinct volcanoes, judging from their conical form and the hard black lava which

in some cases forms their shores. The *emissarium* of Lake Albano (q.v.) still answers its original purpose as an aqueduct. The lake of Solfatara is composed of the waters of hot sulphur springs, and has ls. formed of calcareous deposit. This plain formed in olden times no inconsiderable part of 'the splendour that was Rome,' as is attested by the numerous ruined tns to be found there. In those times the C. was well populated and very fertile; but it was only by the skill and care of the anct inhab. that it was made so, and even then many of the tns in the dist. were unhealthy at certain seasons, according to Livy, Strabo, Cicero, and others. The main cause, however, of the marked changes, was the increased malignity of malaria. This was doubtless due to the repeated devastations of the land by the

Goths, the Vandals, and the Longobards, and more recently by the Normans and Saracens. Sev. of the popes attempted to improve its condition, and the It. Gov. has taken up the problem. Drainage and riv. embankment have been carried out, and large numbers of eucalyptus-trees have been planted. The malaria problem has also been attacked. The sparse pop. rears horses, buffaloes, cattle, sheep, and goats; a few cereals and some fruit are grown.

Campagnola, Domenico (c. 1482-?), It. painter, noted for his frescoes in the Scuola del Santo, Florence, and his oil paintings in the Scuola del Carmine. He studied under Titian. His most notable work is the 'Adam and Eve' in the Pitti Palace, Florence.

Campan, Jeanne Louise Henriette (née Genet) (1752-1822), Fr. authoress, b. Paris. She was appointed reader to the daughters of Louis XV in 1767, and Marie Antoinette later made her first lady of the bedchamber. She kept a school for young ladies at St Germain until 1807, when Napoleon Bonaparte founded a school at Ecouen, and appointed her principal thereof, a post which she held until the abolition of the school by Louis XVIII. Her best-known work is her *Mémoires sur la vie privée de Marie Antoinette*, 1823.

Campanella, Tommaso (1568-1639), It. philosopher and poet, b. Stilo, in Calabria. While still quite young he showed great talent, and was admitted into the Dominican order at the age of 15. Like Bacon, of whom he was a contemporary, he 'took all knowledge for his province,' but specialised in philosophy. He was opposed to the doctrines of Aristotle, and in his *Philosophia Sensibus Demonstrata*, pub. at Naples in 1591, he endeavoured to show that philosophy should be grounded, not so much on *a priori* conceptions, as on the observation of the natural world. After travelling to Rome he proceeded to Florence, where he was well received by the Grand Duke Ferdinand. Returning to Naples in 1598, he was in the following year arrested in Calabria, whither he had gone on a visit, on a charge of conspiracy against the Sp. Gov., which then held sway over Naples. He was accused of having schemed to obtain Turkish assistance in making himself the ruler of Calabria. Though there does not appear to have been any evidence against him, he was imprisoned, tortured, and condemned to perpetual confinement. Whilst in prison he wrote many philosophical and poetic works. Pope Urban VIII procured his removal to Rome in 1626, and in 1629 he was set free and given a pension. He betook himself to France in 1634, being afraid of further persecution; he was received with honour by Louis XIII and Richelieu, and was an honoured figure among the savants of that country. He devoted himself to philosophic studies until his death, which occurred at the monastery of his order in Paris. He attempted to form a philosophy of hist. and politics, the principle of which was the general progress of man

leading to a millennium. Among his numerous writings may be mentioned *La Città del Sole*, 1623 (trans. T. W. Halliday, 1937); *Poesie*, 1622; *Philosophia Rationalis*, 1638. C.'s complete works were ed. by A. D'Ancona (2 vols.), 1854. See E. G. Gardner, *Campanella and his Poetry*, 1923.



E.N.A.

THE BASILICA AND CAMPANILE OF SAN APOLLINARE NUOVA, RAVENNA

Campania, region (compartimento) of S. Italy, comprising the provs. of Avellino, Benevento, Naples, Salerno, and Caserta (qq.v.). It extends along the coast of the Tyrrhenian Sea, and is bounded N. by Abruzzi e Molise, NW. by Lazio, E. by Basilicata, and NE. by Apulia (qq.v.). It contains part of the S. Apennines (q.v.) and has extensive coastal plains. It is renowned for its scenery, its luxuriant vegetation, and its climate. In Roman times C. (a dist. of lesser extent than modern C.) was the scene of many legends; Lake Avernus (see AVERNO) and the Sibyl's Cave (see CUMAE) were situated there. The aristocracy of Rome built magnificent country houses in the interior, which is crossed by the Appian Way (q.v.). All the names of the cities are rich in classical associations—Puteoli (Pozzuoli), Cumae (Cuma), Parthenope (Naples), Capua, Beneventum (Benevento), Nola, etc., and in C. were the three cities buried in the eruption of Vesuvius (q.v.) in AD 79: Herculaneum,

Pompeii, and Stabiae (q.v.). The region produces cereals, hemp, silk, sulphur, fruit, and wine (the 'Falerian,' q.v., of the Romans came from C.). The chief tn is Naples. Area 5244 sq. m.; pop. 4,509,000.

Campanile (It. 'bell-tower', from Lat. *campana*, a bell) is a term applied to towers erected in close proximity, though not attached, to many churches in Italy. They are tall, usually square, and often graceful. The earliest examples are at Ravenna (see illustration). There are sev. fine brick C.s of the 8th-11th cents. in Rome. The 'leaning tower' at Pisa is perhaps the best known, owing to its remarkable deviation from the perpendicular. It was begun in 1174. Eight storeys, each surrounded by columns, form the tower, which inclines almost 13 ft from the vertical. Giotto designed the C. at Florence in 1334. It is 275 ft high, and is adorned with allegorical bas-reliefs and statues. The C. of St Mark's in Venice had 8 storeys, tapered slightly, and terminated in an open loggia of marble, containing 5 huge bronze bells. The loggia, forming the belfry proper, was surmounted by the statue of an angel in copper. The total height of the structure was 325 ft. Its construction was begun in 902, but the belfry was not added till 1510. On 14 July 1902, 1000 years after the tower had been started, it collapsed in ruins, but was completely rebuilt by 1910, exactly as it had been. Another fine C. is the Torre del Comune, Verona, 1172. (For English and other examples see BELFRY.)

Campanology, the art of bell ringing, where each bell is swung by a ringer through a full circle of 360 degrees, starting from an upside-down position or mouth upwards. In this position the ringer may hold his bell poised so as to allow him to change his position with the other bells in the peal, which may number from 3 to 4 up to 12. On 3 bells it is possible to ring 6 changes, on 4—24, 6—720, 8—40,320, and 12—479,001,600 changes. See also BELL.

Campanula (dimin. of Lat. *campana*, bell), typical genus of the Campanulaceae, contains about 300 species of herbs, usually perennial, rarely ann. or biennial. The bell-flowers, or bell-worts as they are often called, are found in N. temperate regions and as alpine plants in warm regions. Older names for the genus were *Trachelium* and *Cervicaria*, from the supposed power of many species of curing diseases of the trachea and neck. Perhaps the commonest in Britain is *C. rotundifolia*, called in Scotland the bluebell and in England the harebell; the graceful stem and the delicate hue of the flower make it one of the daintiest members of our flora. The flower-juice yields a very good blue ink, and when mixed with alum a green one. *C. pyramidalis*, the chimney plant, is indigenous on rocks and walls in Carinthia, Carniola, and Dalmatia, but is often cultivated for its tall raceme of beautiful flowers, when the plant attains a height of about 3 ft. *C. medium*, the Canterbury

or Coventry bell, is a native of central Europe, and is a biennial from which have been obtained many varieties differing greatly in size and colour, and often cultivated in gardens. *C. trachelium*, the nettle-leaved bellflower, is a European species with large blue bell-shaped flowers; *C. glomerata*, the clustered bell-flower, occurs in England in both a wild and cultivated state; *C. rapunculoides*, the garden rampion or ramps, has an edible root, and the leaves are sometimes used in salads; *C. latifolia*, the giant bell-flower or hawk-wort, is found on dry mt pastures; *C. rapunculoides*, creeping bell-flower, occurs in the N.; *C. patula*, the spreading bell-flower, frequents hedges and thickets. *C. portenschlagiana*, a tall species; *C. erinus*, a forked plant; and *C. macrostyla*, a long-styled ann. sometimes known as the candelabrum bell-flower, are all further examples of the genus which flourish in Brit. gardens.

Campanulaceae, family of dicotyledonous plants. The species are occasionally trees or shrubs, but mostly herbs with a milky latex; about 1200 species flourish in warm climates. The calyx consists of 5 sepals, the corolla of 5 united petals, the androecium of 5 epigynous stamens, the inferior gynaecium of 2 to 5 united carpels, with usually a trilocular ovary, containing numerous ovules. The fruit may be a capsule or, less frequently, a berry. Genera include *Adenophora*, *Campanula*, *Downingia*, *Jasione*, *Lobelia*, *Michauxia*, *Trachelium*, and *Wahlenbergia*.

Campanularia, genus of Hydrozoa, common in European seas. They have stems bearing sporosacs, small bell-like cups containing the zooids or polyps. In some Hydrozoa these go free as 'swimming bells,' but in the C. they are stationary.

Campbell, Alexander (1788-1866), Amer. preacher, was b. Ireland. In 1809 he went to America to join his father, a Presbyterian minister, who had formed a 'Christian Association' at Washington, Pennsylvania, to promote Christian unity on evangelical principles. In 1811 Alexander became minister at Bethany, (W.) Virginia, and in 1812 succeeded his father as leader of the new Church, self-named 'Disciples of Christ,' but generally known as Campbellites (see CHRIST, DISCIPLES OF). Teaching baptism by immersion, he yet fell out with the Baptist churches of Virginia and Pennsylvania, and subsequently with the whole Baptist connection. From 1841 to his death he was president of Bethany College.

Campbell, Archibald, see ARGYLL, DUKES OF.

Campbell, Sir Colin, Baron Clyde (1792-1863), the son of a Glasgow carpenter. His maternal uncle Col. C. provided him education, and in 1808 procured him a commission. He fought at Walcheren and through the Peninsular war, earning a captaincy. After 30 years of active service and garrison duty he became lieutenant-colonel in 1837, and for brilliant services in the second Sikh war, particularly at Chillianwala (Chillianwalla) and Gujrat (Punjab), was made K.C.B.

and appointed in command at Peshawar. Later he commanded the Highland Brigade in the Crimea. In the mutiny year, when appointed by Palmerston commander-in-chief in India, he started from London next day, and within a few months stamped out the rebellion. Made Baron Clyde and field marshal in 1858, he returned home in 1860, and was awarded a pension of £2000. See lives by A. Forbes, 1896, and A. Shadwell, 1881.

Campbell, Donald Malcolm (1921-), b. Povey Cross, Surrey, son of Sir Malcolm Campbell (q.v.), holder of the world speedboat record with his turbo-jet hydroplane *Bluebird* at 239.07 m.p.h. (Coniston Water, 7 Nov. 1957). His 2 previous world records were 225.63 m.p.h. (Coniston, Sept. 1956), and 216.3 m.p.h. (Lake Mead, Nevada, U.S.A., Oct. 1955). C.B.E., 1957.

Campbell, George (1718-96), theologian, b. Aberdeen, and educ. at Marischal College. He was apprenticed at Edinburgh to a writer to the signet, but left the law in 1741 in order to study divinity. He became prin. of Marischal College in 1759, and prof. of divinity there in 1771, in which year he also became minister of Greyfriars. The work by which he is principally known is his *Dissertation on Miracles*, a reply to Hume, pub. in 1763. His *Philosophy of Rhetoric*, pub. in 1766, shows sound learning and good critical judgment. His other works include a new trans. of the Gospels (1778), and *Lectures on Ecclesiastical History*, pub. 4 years after his death in 1800.

Campbell, George Douglas and John, see ARGYLL, DUKES OF.

Campbell, Gordon (1886-1953), Brit. vice-admiral. In the First World War he commanded 'Q' or so-called mystery ships, on which he pub. in 1929 a book entitled *My Mystery Ships*. Awarded the V.C. in 1917. After the war he commanded in turn the *Impregnable* and *Tiger*. Rear-admiral, 1928. M.P. for Burnley, 1931, defeating Arthur Henderson.

Campbell, Henry Colville Montgomery (1837-), Bishop of London since 1956, educ. at Malvern College and Brasenose College, Oxford. He took up his first curacy in Alverstoke; in the First World War he was a chaplain to the forces (1915-17), and was a Territorial Army chaplain, 1926-38. Between 1917 and 1940 he held various London livings. In 1940 he became suffragan Bishop of Willesden, and from 1942 to 1949 was suffragan of Kensington, whence he was translated to the see of Guildford. In 1956 he was translated to the see of London in succession to Dr J. W. C. Wand (q.v.).

Campbell, Ignatius Roy Dunnachie (1901-57), S. African poet, b. Durban. During the First World War, when he was 15, he enlisted in the 6th S. African Infantry, but was sent back to Durban High School. Later he came to England and studied at Oxford, but failed to pass his examinations and lived in France for a time. In 1922 he married Mary Gar-

man and they lived in a fisherman's cabin in Wales, where he wrote *The Flaming Terrapin*, 1924. After a period editing *Voorslag* in S. Africa he was a bull-fighter in Spain from 1928 to 1931. In the Sp. Civil War he served with Franco's forces, and in the Second World War he served with the British in Africa. In 1935 he was converted to Rom. Catholicism. His works include *The Waygoose*, 1928, *Adamastor*, 1930, *The Gum Trees*, 1930, *Poems*, 1930, *The Georgiad*, 1931, *Flowering Reeds*, 1933, *Mithraic Emblems*, 1936, *Flowering Rifle*, 1939, *Talking Bronco*, 1940, *Sons of the Mistral*, 1941, and *Lorca*, 1952; his *Collected Poems* appeared in 1949. *Broken Record*, 1934, and *Light on a Dark Horse*, 1951, are autobiographical works. Campbell's poetry has a strong rhetorical strain, and he has been called 'the Byron of our time.'

Campbell, John, 1st Baron Campbell (1779-1861), lord chancellor of England, son of the Rev. George C. of Cupar, and was called to the Bar in 1806. He entered Parliament as member for Stafford in 1830 and was re-elected in 1831. He made his mark as a practical man of business, and was concerned in many useful measures, mostly connected with the rectification of abuses. He strongly supported Lord John Russell's first Reform Bill, and in 1832 was knighted and appointed solicitor-general. Sitting for Dudley, 1832-4, he was then elected at Edinburgh, and represented that city until 1841, taking part, as a Whig, in many fierce contests, especially concerning the abolition of church rates and the reform of eccles. courts. In 1840, as attorney-general, he conducted the prosecution of Frost and other Chartists, who were found guilty of high treason, and in the following year he became chancellor of Ireland, with the title of Baron C. of St Andrews. He resigned the chancellorship a few weeks later, and devoted his leisure to writing *The Lives of the Lord Chancellors and Keepers of the Great Seal*, 1845-69, a work which brought him both fame and obloquy.

Campbell, John Francis (1822-85), folklorist, b. Islay. Educ. at Eton and Edinburgh, he became secretary to the Lighthouse Commission. He collected a large number of highland songs and legends, which he pub. under the title *Popular Tales of the West Highlands* (4 vols.), 1860-2. He also pub. various Gaelic texts.

Campbell, John McLeod (1800-72), minister son of the Rev. John C. of Kilninver, Argyllshire, educ. at Glasgow and Edinburgh. Soon after 1825 his teaching on the doctrine of the Atonement aroused so much hostility that in 1830 he was charged with heresy. The General Assembly considered the offence proved, and removed him from office. He then went on an evangelical mission to the highlands, and afterwards ministered at Glasgow in a large chapel erected by his supporters. In 1856 he pub. *The Nature of the Atonement*, which was very widely read.

Campbell, Sir Malcolm (1884-1949),

motor engineer who frequently held the world's motor speed record. Sir Henry Segrave (q.v.) was the first to reach a speed of over 200 m.p.h., his time on Daytona Beach, on 23 Mar. 1927, being 203.79 m.p.h. or 29 m.p.h. better than the previous record held by C. On 19 Feb. 1928, C. reached 206.96 m.p.h., which record was beaten by Ray Keech, the Amer. motorist, on 22 April 1928, at 207.55 m.p.h., both performances being on Daytona Beach. Then on 11 Mar. 1929 Segrave reached 232 m.p.h., but was in his turn beaten on 5 Feb. 1931, by C. with 246.15 m.p.h. The 'Blue Bird' Napier-C. motor with which this record was accomplished had been often rebuilt since it was begun in 1924. At Daytona in 1931 he attained a mean average speed of 246 m.p.h., and, in 1933, 272 m.p.h. In 1935 he set up a new world's record, over a measured mile of 301 m.p.h. Knighted in 1931. In 1937 on Lake Maggiore he estab. a motor-boat record of 129.5 m.p.h. In 1938 in his *Blue Bird* he broke his own speed-boat record by averaging 131.41 m.p.h. for 2 runs over Lake Hallwil, Switzerland. Held the world's record for the fastest trip on water: this was on 19 Aug. 1939, on Coniston Water, his record being 141.74 (142.85 and 140.62) m.p.h.

Campbell, Mrs Patrick (Beatrice Stella Cornwallis-West) (1865-1940), actress, b. Kensington, daughter of John Tanner and Louisa R. Romanini; married Patrick C., who was killed in the S. African war in 1900, and then Maj. George Cornwallis-West. Gained a scholarship at the Guildhall School of Music. At 23 took up acting as a profession, making her first appearance at Liverpool. Between 1891 and 1893 she was in melodrama at the Adelphi Theatre, where George Alexander singled her out for the part of Paula in Pinero's *The Second Mrs Tanqueray*. This was the part of her life and her performance put her at once in the front rank of Eng. actresses. Success after success now followed under Alexander, Tree, and Hare. In 1895, at the Garrick Theatre, she acted the title part in Pinero's *The Notorious Mrs Ebbelth*. In a season of joint management with Forbes-Robertson at the Lyceum, she played Juliet, Militza in *For the Crown* (John Davidson's rendering of *Pour la couronne*), Magda (Sudermann), Lady Teazle, Ophelia, Lady Macbeth, and Paula. Among other good performances were the Rat Wife in Ibsen's *Little Eyolf* in 1897; Mélisande in Maeterlinck's play *Pelléas et Mélisande*, Hilda Tesman in *Hedda Gabler*, and Deirdre in W. B. Yeats's play *Deirdre*. In 1914 she gave her memorable performance of Eliza Doolittle in G. B. Shaw's *Pygmalion*. In later years she was chiefly occupied in film work. In her youth she had a strange disturbing personality and a languorous It. beauty inherited from her mother; but besides these advantages, she had a keen and cutting wit and a strong sense of humour, a beautiful voice and perfect enunciation. The simpler emotions were not her true sphere, but she could express the passions with rare

intensity. Pub. *My Life and Some Letters*, 1922.

Campbell, Reginald John (1876-1956), Christian minister, b. London; son of a Methodist minister. Educ. privately; also at Univ. College, Nottingham. He went to Oxford in 1891, intending to enter the Estab. Church; but he became minister of the Union Street congregational church, Brighton, and, on the death of Joseph Parker, succeeded him at the City Temple, London, 1903-15. He issued a book called *The New Theology* in 1907, and filled the Temple continually, but the controversy he aroused over these works has long abated. In 1916 he was received into the Church of England. C. was vicar of Christ Church, Westminster, 1917-21. Vicar of Holy Trinity, Brighton, 1924-9. Other pub.: *A Spiritual Pilgrimage*, 1916, and *Life of Christ*, 1921.

Campbell, Thomas (1777-1844), poet, b. Glasgow. He was educ. at the grammar school and univ. there, and in 1795 went to the Is. of Mull as a tutor. Two years later he settled in Edinburgh to study law, but he found the occupation little to his taste, and instead wrote *The Pleasures of Hope*, which appeared in April 1799, and went through 4 eds. within a year of pub. In 1800 he travelled on the Continent for some months and visited Munich, Leipzig, and Copenhagen. While he was staying at Hamburg he witnessed the battle of Hohenlinden; there too he met the hero of his *Erle of Erin*. He contributed articles to the *Edinburgh Encyclopaedia*, and ed. the *New Monthly Magazine*, 1820-30. C.'s longer poems, *The Pleasures of Hope*, *Gertrude of Wyoming*, 1809, and *Theodorice*, 1824, are not much read now. His war songs, 'Ye Mariners of England,' 'Hohenlinden,' and 'The Battle of the Baltic,' are written with a fine energy, and are, for stirring patriotism, unequalled in our language. C. d. at Boulogne, and was buried in Westminster Abbey. Works ed. by Washington Irving, 1810; W. A. Hill, 1851; W. M. Rossetti, 1880, and J. Robertson, 1911. See also W. Beattie, *Life and Letters of Thomas Campbell*, 1849; C. Redding, *Literary Reminiscences and Memoirs of Thomas Campbell*, 1860; J. C. Hadden, *Thomas Campbell*, 1899; W. M. Dixon, *Thomas Campbell: an Oration*, 1928.

Campbell, William Wilfrid (1861-1918), Canadian poet, b. Berlin, W. Ontario. He was educ. at Toronto and Cambridge, Massachusetts, and entered the Episcopal Church, but soon resigned. Among his works are *Lake Lyrics*, 1889, *Dread Voyage*, 1893, *Mordred and Hildebrande*, 1895, *Beyond the Hills of Dreams*, 1899, *The Practical Side of Imperialism*, 1904, *Sagas of Vaster Britain*, 1906, *Canada*, 1907, and *War Poems*, 1915.

Campbell-Bannermann, Sir Henry (1836-1908), statesman, b. Glasgow, and educ. at Glasgow High School, Glasgow Univ., and Trinity College, Cambridge. In 1868 C.-B. successfully contested Stirling Burghs as a Liberal in the general election which followed the Reform Act of 1868. In 1871 he became financial secretary to

the War Office. He was again financial secretary for war, 1880-2, secretary to the Admiralty, 1882-4, and was given Cabinet rank in 1884, becoming chief secretary for Ireland. In 1886 he announced his adherence to his leader, Gladstone, when the latter declared himself in favour of Home Rule, and was secretary for war in 1886, fulfilling the same office in the gov. of 1892-5. When Harcourt resigned the Liberal leadership in 1898, C. was selected for the vacant post. The outbreak of the Boer War, the opposition of C.-B. to the Imperial policy of a section of the Liberal party, led to still graver differences, but in 1901 a meeting of the party unanimously confirmed him in his leadership. In 1905 the Unionists resigned and the king sent for C.-B. At the election which followed the political pendulum swung, the Liberals being returned with a large majority. The prin. measures of his gov. were an Education Bill, an Irish Councils Bill, and a Plural Voting Abolition Bill, all of which were either rejected or previously altered by the House of Lords. Amongst the important measures which were passed may be mentioned the Small Holdings Act, a Trades Dispute Act, the Patents Act, and the Merchant Shipping Act. But almost immediately after his acceptance of the premiership C. began to fail in health, and to be unable to fulfil the duties of the office, and the leadership of the House passed practically into the hands of Asquith, and ultimately C.-B. resigned less than 3 weeks before his death. See life by J. A. Spender, 1923.

Campbell Family. In 1280 Colin Mor C. of Lochaw was knighted by Alexander III., and in 1445 Sir Duncan received a peerage. The family became Earls of Argyll in 1457; the marquise dates from 1640, and the dukedom from 1701. The C.s of Breadalbane, Cawdor, and Loudon are cadet branches of the family. See also ARGYLL, DUKES OF.

Campbellites, see CHRIST, DISCIPLES OF.
Campbelltown, N. Carolina, see FAYETTEVILLE.

Campbelltown, tn in Cumberland co., New S. Wales, Australia, adjacent to the metropolitan area of Sydney. Dairy and poultry farms are situated in the neighbourhood. Pop. 10,120.

Campbeltown, burgh and seaport in Argyll, Scotland, on the Kintyre peninsula, 36 m. S. of Tarbert, anciently called *Dalruadhain*. The harbour, sheltered by Davaa Is., is excellent; the main industries include herring and white fishing, net making, creamery, and whiskey distilling. Pop. 7,170.

Campeche: 1. State of SE. Mexico, level in character, with mixed forests; rice, sugar-cane, and tobacco are grown, and cattle are grazed. Dye-woods, cordage of sisal hemp, cotton, and indigo are the prin. exports. Area of state, 19,672 sq. m.; pop. 121,400.

2. City, cap. of above state, situated on C. Bay, 90 m. to the SW. of Merida. The harbour is safe but shallow. Manufs. include cigars, cigarettes, and chocolate. The city was founded in 1540 on the site

of a vast series of catacombs of the Mayas, and was repeatedly sacked by buccaneers, who knew it as Campeachy. Pop. 23,280.

3. Gulf of C., inlet of the Gulf of Mexico. The main ports are Veracruz, Coatzacoalcas, Carmen, and C.

Camperdown, tn in Victoria, Australia, 121 m. SW. of Melbourne, the centre of a prosperous dairying and pastoral dist.

'Camperdown,' 10,600-ton Brit. battleship, launched in 1885, which rammed and sank the *Victoria* in collision in the Mediterranean in 1893.

Camperdown, Battle of, Eng. naval victory over the Dutch, fought on 11 Oct. 1797, which served to wipe out the disgrace of the mutiny of the *Nore*, the Dutch fleet under De Winter being destroyed. The victor was Adm. Duncan, whose fleet comprised 7 ships of 74 guns, 7 of 64, besides a few frigates and cutters; the Dutch fleet, of 4 of 74 guns, 7 of 64, and other smaller ships, being only slightly inferior in strength. Duncan captured no fewer than 11 of the Dutch ships, but the casualties were heavy on both sides. The battle was fought a few m. off the Dutch coast, near the vil. of C., and Duncan, in recognition of the victory, was created Lord Duncan of C.



CAMPHOR

Camphor ($C_{10}H_{16}O$), waxy, translucent substance closely related to the ethereal oils, obtained from the C.-tree (*Cinnamomum camphora*). It is produced in Japan along the coast of China, but mostly in the is. of Formosa. The substance is obtained by storing chips of C. wood in earthenware vessels closed at the top, into which a current of steam enters. The C. is volatilised, and passes with the steam to the top of the pots, where it condenses in the form of small white crystals. C. has a sp. gr. nearly equal to that of water, melts at $178^{\circ}C.$, and boils at $204^{\circ}C.$ The main use of C. is in the manuf. of celluloid. It is used as an ingredient in many liniments for sprains, muscular rheumatism, etc. It is also largely used to keep away moths and noxious insects from clothing, furs, stuffed animal specimens, etc. C. was synthesised by Komppa in 1909, and it is now manuf. artificially from turpentine.

Camphor Oil, reddish liquid which is produced in the distillation of chips of the C-tree. The crude product usually contains a quantity of C. in solution.

Camphoric Acid ($C_{10}H_{16}O_4$), substance formed by digesting camphor with nitric acid. It forms colourless flakes which do not readily dissolve in water.

Camphorsulphonic Acid, $C_{10}H_{14}O \cdot SO_3H$, made by the action of fuming sulphuric acid on camphor, is a white crystalline solid used by Sir Wm Pope (1870-1939) in his classical researches upon stereochemistry.

Campi, or Campo, family of It. artists, of the school of Cremona, their bp.

Galeazzo Campi (1475-1536), the founder of the family. He was a pupil of Roccacino, but his style is in imitation of Perugino. His 'Resurrection of Lazarus' is at Castelmaggiore.

Giulio Campi (1502-72), son and pupil of Galeazzo. He studied under Giulio Romano at Mantua, but modelled his style on that of the great masters.

Antonio Cavaliere Campi (c. 1522-c. 1600), studied with his brother Giulio under Giulio Romano. He painted historical pieces in oil and fresco, modelling his art upon Correggio. His prin. pictures are 'St Paul raising Eutychus,' an altar-piece of the Nativity, and 'St Jerome in Meditation' (in the Prado). He was commissioned to paint for Philip II of Spain at Madrid, and won some reputation as an architect and writer.

Bernardino Campi (1522-1592), was probably related to this family. He studied under Giulio C. and Ippolito Corta at Mantua, and imitated the work of Titian, Raphael, and Correggio. He was chiefly employed in the churches of Italy. In 1584 he pub. a treatise on painting, *Parer sulla pittura*.

Campine, see KEMPEN.

Campion, Edmund, Blessed (1540-81), Jesuit, b. London, his father being a bookseller. Educ. at Christ's Hospital and Oxford. Reconciled to the Catholic Church in 1571, he went to Douai, and, 7 years later, was ordained deacon and priest by the Archbishop of Prague. Came to England on a Jesuit mission and pub. his *Decem Rationes* against Protestantism. Arrested in Berks in 1581, where he had taken refuge on account of the gov's proclamation against Jesuits, he was racked in the Tower and martyred at Tyburn. Beatified in 1886, his feast is on 1 Dec. See lives by Richard Simpson, 1867, and by E. Waugh, 1935.

Campion, Thomas (1567-1619), poet and musician, b. Witham, Essex. Educ. at Cambridge and on the Continent, he studied law at Gray's Inn, but discarded it and practised medicine in London. He was a delicate writer of vocal music for the lute accompaniment usual at this period, composed masques that are among the best of their kind, and produced many fine lyrics notable for their metrical finish. His songs are light as thistledown, seeming to float away in the air. The best known are 'There is a Garden in her Face' and 'My Sweetest Lesbia, Let Us Live and Love,' a fine trans. from Catullus. C. wa

concerned in 5 books of airs, making up 3 collections, which were pub. approximately between 1601 and 1617. He also wrote *Poemata*, 1595, in Latin, containing poems, elegies, and epigrams. His *Observations on the Art of English Poetic*, 1602, is an attack on the use of rhyme and a plea for the adoption of unrhymed metres formed on classical models, such as are used in C.'s own 'Rose-cheeked Laura, Come.' Daniel's *Defence of Ryme* was an answer to this work. C. also composed the music for most of his songs. His works were ed. by A. H. Bullen, 1889, and by P. S. Vivian, 1909. See E. Arber, *An English Garner: Shorter Elizabethan Poems*, 1903; T. MacDonagh, *Thomas Campion and the Art of English Poetry*, 1913; M. M. Kastendieck, *England's Musical Poet*, 1938.

Campion, popular name of sev. species of *Silene* and *Lychnis*. *Silene cucubalus* is the bladder C.; *S. maritima* the sea C.; *S. acaulis* the moss C.; *Melandrium album*, white C.; *M. rubrum*, red C.; and *M. noctiflorum*, night-flowering C.

Campion Hall, Oxford, is a private hall of the univ. It was founded in 1896 for members of the Society of Jesus.

Campo, Conrado del (1876-1953), Sp. musical composer, b. and d. Madrid. One of the chief figures in modern Sp. music. He possessed a complex musical mind, and though accused of opposition to Sp. traditions, he has been also described as the Sp. Strauss; he had a mastery of modern technique and excelled in chamber and symphonic music. All his works, and they are very numerous, have been performed in Spain, many having won prizes. He was for many years the viola soloist at Madrid Royal Opera House and the Orquesta Sinfónica, of which he was a founder. Operas and other works: *El Final de Don Alvaro*; *La dama desconocida*; *Leonor Teller*; *Los Amantes de Verona* (on *Romeo and Juliet*); *Tragedia del beso*; *Dies Irae*; *Avapiés*; *La flor del agua*; *La divina comedia* (orchestral work with chorus on Dante's *Inferno*); *Granada y Galicia* (a symphonic poem); *Danza del Níaxu* (orchestral); *Kusida*; *Don Juan de España* (incidental music for Martínez Sierra's play); *Aires, airíos, aires* (for orchestra, solo voice and chorus).

Campo Formio, see CAMPOFORMIO.

Campoamor, Ramón de (1817-1901), Sp. poet and politician, b. in the Asturias. He studied medicine, but deserted it for poetry and politics. A zealous Conservative, he served as Governor of Alicante and Valencia. His ventures into the sphere of drama are by no means remarkable. His 2 chief plays are *El Palacio de la Verdad*, 1871, and *Dies Irae*, 1873; *El Drama Universal* is a pretentious poem in 8 cantos. He gained great fame in his day, but his work is now forgotten. Only a few of his *doloras* and *humoradas* are to-day considered readable. See A. Gonzalez Blanco, *Campoamor, biografía y estudio crítico*, 1911.

Campobasso (formerly Molise): 1. Prov. of Italy, in S. Abruzzi e Molise (q.v.). It is mountainous and has some high the Apennines (q.v.), but has a

coastal plain on the Adriatic in the NE. It is crossed SW.-NE. by the Biferno. The prin. tns include C., Isernia, Casacalenda, and Larino (qq.v.). Area 1750 sq. m.; pop. 406,000.

2. It. tn, cap. of the prov. of C., built partly on a hill crowned with a 16th-cent. castle, 84 m. SE. of L'Aquila (q.v.). There are sev. fine churches. C. has an important cutlery industry, and silk and paper manufs. Pop. 30,000.

Campoformido (formerly **Campo Formio**), It. vil., in Friuli-Venezia Giulia (q.v.), 5 m. SW. of Udine (q.v.). By the treaty signed here between France and Austria in Oct. 1797 Austria received Venice in return for Lombardy and the Belgian Netherlands (see NAPOLEON I). Pop. 3000.

Campos, Álvaro de, see PESSOA, FERNANDO.

Campra, André (1660-1744), Fr. composer, b. Aix-en-Provence, where he learnt music at the church of Saint-Sauveur. After some prov. church appointments he moved to Paris in 1694 and became musical director at Notre-Dame, where his motets became famous. In 1697 he produced his first stage work, the operaballet *L'Europe galante*. Between this and his last opera, *Achille et Déidamie*, given in 1735, he brought out about 40 dramatic works which earned him great fame and make a link between Lully and Rameau. He also wrote masses, motets, psalms, and cantatas.

Camps, in archaeology, see HILL FORTS.

Campus Martius (the field of Mars) was the name given to a large plain skirting the walls of Rome on the NW. side. It was sacred to Mars, and was therefore used for military manœuvres, contests, etc. During the later period of the rep. it was laid out in walks, baths, etc., and was used as a public recreation ground.

Campus Stellae, see SANTIAGO DE COMPOSTELA.

Camrose, 1st Viscount, William Ewert Berry (1879-), journalist and newspaper proprietor, b. Merthyr Tydfil, of which his father was mayor. Entering journalism, he came to London and in 1901 founded the *Advertising World*. With his brother James Gomer Berry (see KEMSLEY) he acquired the *Sunday Times* in 1915 and later the *Financial Times*. Together they built up the vast aggregation of newspapers, magazines, and annuals known

as the Amalgamated Press, with ramifications all over Britain. In 1928 they purchased the *Daily Telegraph*, of which C. became editor. During the Second World War he did valuable work at the Ministry of Information. He was made a baronet in 1921, a baron in 1929, and a viscount in 1941.

Camrose, city of Alberta, Canada, 69 m. SE. of Edmonton, incorporated as a tn in 1906, named after C., in Pembrokeshire, Wales. Originally called Sparling, its name was changed to avoid confusion with Stirling, Alberta, and Sperling, Manitoba. C. became a city on 1 Jan. 1955, and is the youngest city in Alberta. It is centre of an extensive farming area, and the largest legume seed-cleaning and processing plant in the commonwealth is located here; other industries include flour milling, woodworking and metal working, and coal mining. C. is served by both the Canadian National Railways and the Canadian Pacific Railway. In recent years oil wells have been developed in the area. Pop. 6100.

Camulodonum, see COLCHESTER.

Camus, Albert (1913-), Fr. writer, b. Mondovi, Algeria, of a Sp. mother and Alsatian father. C.'s first pubs. were essays, *L'ennemi et l'indroït*, 1937, and *Noces*, 1938, pub. in Algeria. In France, during the Second World War, he took part in the resistance movement, and helped to found the underground periodical *Combat*, for which he wrote a series of profound philosophical essays, which reveal an atheistic and nihilistic outlook. The problem of solitary man, alone against a hostile world, is treated in his first novel *L'Étranger*, 1942 (Eng. trans. *The Outsider*, 1957). In 1947 appeared *La Peste* (Eng. *The Plague*, 1948), a story of life in a modern tn during an epidemic. *La Chute* was pub. in 1956. His plays *Caligula*, 1944, *Le Malentendu*, 1944, and *L'État de siège*, 1948, are less well known than his novels. In latter years C.'s nihilistic attitude has changed to a more active humanism. He was awarded the Nobel prize for literature in 1957. See R. de Luppé, *Albert Camus*, 1951, and P. Thody, *Albert Camus*, 1957.

Camwood, name of a wood obtained from a tree that grows in Africa and Brazil. From it an exceedingly brilliant red dye is obtained, of which the only defect is its lack of permanency.

